THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Sustained demand for nearly all forms of finished material and continued serious difficulty on the part of blast furnaces and steel works in obtaining their raw materials, are the salient features of the iron trade. With a reported capacity on Feb. 1 of 343,111 tons, gauged by their output in January, the blast furnaces of the country were making pig iron at the rate of 17,841,000 tons a year, which is very close to the average for the year 1902, though in December they produced at the rate of 18,447,000 tons a year. The coke supply seems not as great today as in December and snow and extreme cold are further cutting it down this week. Open-hearth furnaces are suffering not only from small pig iron supply but from an increasing scarcity of scrap. Some of the railroads have given notice that no old material will be hauled for two weeks, this order coming on the heels of a steady lessening of stocks of scrap at steel plants. In the Pittsburg district a number of open-hearth plants are on the verge of suspension. Negotiations are under way for the importation of basic iron in view of the scarcity of domestic iron, and it is probable that considerable heavy melting stock will be brought in also. The continued defeat of efforts to increase production of pig iron and as a consequence, of steel, is a fact in the situation of more significance than all the new construction in blast furnaces, steel works and finishing mills. The completion of additional coke ovens is in turn delayed beyond all calculation by the railroad embargo that reaches to brick plants in common with all industry. It is now plain that the increase of coke production will be slower than has been counted on, but even at that the railroads are not improving in ability to haul the coke. The steel corporation has added another new furnace to its outfit the past week, making an increase in the past six months that will yield 650,000 tons more of pig iron in a year, while furnaces under way and about to be undertaken will give the corporation 500,000 tons a year more. All these must be supplied with Frick coke before the merchant furnaces supplying the corporation with iron get any. In the past few weeks these overflow shipments have been very scant. Sales of Bessemer iron are reported in the past week—one 10,000-ton lot at $21.85, Pittsburg, while for immediate delivery smaller lots sell at $22.35 to $22.85, Pittsburg. Reports of purchases of Bessemer by the steel corporation for the second half are persistent, but are not officially confirmed. Negotiations are in progress, but the widely telegraphed coke and pig iron deal for the second half is untrue. The scarcity of steel is a factor East and West. Imported steel is from 50 cents to $1 higher; in the Central West domestic steel for early delivery can scarcely be had. Chicago reports a sale of 3,000 tons of wire rods at $37.50. Options on the Western rolling mills to be taken in by the proposed bar iron consolidation expire Feb. 21 and the prospect now is that the deal will be made. A firmer feeling in bar iron is evident, partly due to this expectation. The volume of business in finished material and the work planned that will require steel, continue to encourage optimistic views of the entire year. Seven bridges at Pittsburg will require 40,000 tons of steel for those not yet let and 20,000 tons for the superstructures of those under way. No change appears in the Southern pig iron situation,—except that the abstention of buyers from second-half iron seems more marked as quick delivery business grows scarcer—this last being due to the fact that there is no longer any such thing as quick delivery of iron, and is not likely to be in the near future. Southern prices continue to range from $18 to $18.50 for No. 2 foundry at Birmingham. The Southern Iron Committee did not order the expected 50 cents advance in pig iron freights last week and it is now believed no advance will be made.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Feb. 18.

The scarcity of heavy melting stock, cast scrap and basic pig iron threatens to shut down a number of the open-hearth furnaces of the large steel producers in this district. A shortage of heavy melting stock has existed for some time, but owing to the large stocks carried at all the mills it was believed that the temporary scarcity could be tided over. The railroad conditions have greatly interfered, however, and stocks have almost entirely dwindled away. The consumption of heavy melting stock has increased in a marked way in the past year, due to the new operations of the Sharon Steel Co. and the Clairton Steel Co. Owing to the great shortage of heavy melting stock which has existed for some time, open-hearth operations have been compelled to depend largely upon cast scrap, while only a comparatively small tonnage of new melting stock, consisting of crop ends, etc., is finding its way into the open market as compared with that offered several years ago. Owing to arrangements with large steel producers in the East, the Clairton Steel Co. has been enabled to secure new melting stock in large quantities, but not sufficient to supply all requirements. The Sharon Steel Co., on the other hand, depended largely on cast scrap for its operations and was necessarily greatly handicapped. Heavy melting stock is now being offered here at $21.50, gross ton, but the offerings are not nearly large enough to supply the demands. Cast scrap is quoted $20.50, gross ton. The action of the railroads in several instances has also interfered greatly with the receipt of old material. In the past few days an embargo on old material has been placed on several of the mills and will extend over a period of two weeks. This action was taken by the railroads, it is reported, owing to the mills refusing to receive the cars of material until they were ready to unload them, thus tying up a large number of cars which could be used to advantage in the present car shortage. Dealers in old material have suffered severe losses as the railroads refuse to deliver the cars of material to the embargoed plants and the scrap must be disposed of elsewhere.

Owing to the scarcity of basic iron for immediate shipment several of the large steel producers are considering the purchases of large amounts of foreign iron, and it is probable that contracts will be closed before the end of the week. In addition inquiries have gone abroad for heavy melting stock to be brought into this district. Some time ago there was considerable buying abroad of low phosphorus scrap by the steel casting manufacturers owing to the scarcity of this material in this district.

The blowing in of another new furnace of the Carnegie Steel Co. at its Edgar Thomson plant will increase the output of this company 500 tons a day, but this added tonnage and that of the other stack recently placed in operation are insufficient to meet the requirements. During the past six months the United States Steel Corporation has increased the output of the two Isabella stacks of the American Steel Hoop Co. from 250 to 400 tons daily; a stack of the National Tube Co. at Benwood, W. Va., was blown in with a daily capacity of

600 tons, and the two stacks at the Edgar Thomson plant were added with a daily production of 1,000 tons. Thus the annual output has been increased by 650,000 tons, while a fifth stack at the Carrie plant of the Carnegie Steel Co. will be placed in operation within a few months, further increasing the annual output about 200,000 tons. At Youngstown, O., the National Steel Co. will shortly break ground for a fourth stack, the plans for which were announced some time ago but for which the appropriation has just been made. This will add another 200,000 tons to the annual output. The rebuilding of stacks at New Castle, Pa., will mean 100,000 tons more a year. The new stacks at Sharon, Pa., and Donora, Pa., are not counted in the above, inasmuch as they will provide iron for the plants at those places; but in the case of Donora, a larger tonnage of steel will be available for the finishing mills of the Carnegie Steel Co., when the furnaces and open-hearth plant are completed there, as the Duquesne plant now furnishes the steel for the Union plant, amounting to about 500 tons a day. Despite this great increase in the output of pig iron the corporation plants are still short, which indicates that the production of steel and the consumption of finished material are increasing steadily.

PIG IRON.—We note the sale of 10,000 tons of Bessemer iron for delivery during the next three months at $21.85, Pittsburg. Sales of smaller lots have been reported at prices ranging from $21.50 to $22 at the furnace for immediate delivery. Basic iron for prompt delivery is not to be had, although there is a big demand for prompt iron. For deliveries during June, July and August, some of the furnaces are asking $20.50 to $21. Considerable English iron is now coming into this market to replace the iron purchased months ago from the Dominion Iron & Steel Co. owing to the failure of the latter to make deliveries. No. 2 foundry iron for prompt shipment is held at $22.50 to $23, while forge iron is quoted at $20.75 to $21. There is little buying of either foundry or forge, although small contracts for foundry iron for the second half are being placed at $22 to $22.25. We make the following quotations:

Bessemer, Valley	$21 50 to 22 00
Bessemer, Pittsburg	22 35 to 22 85
No. 1 Foundry	23 50 to 24 00
No. 2 Foundry	22 00 to 23 00
Gray Forge, Pittsburg	20 75 to 21 00
Chilled Basic, Valley	21 50 to 22 00
Chilled Basic, Pittsburg	22 35 to 22 85

STEEL.—There have been no sales of Bessemer steel during the week and the market continues nominally at $30 to $30.50, Pittsburg. Open-hearth steel is held at $31 and upwards, according to the analysis. Foreign steel is quoted at $30.25 to $30.50, and is not in demand at these prices.

FERRO-MANGANESE.—Domestic ferro, 80 percent, remains at $50 at the furnace in carload lots, while English manganese is quoted at $52.50 in carload lots and over delivered at the buyer's mill. In less than carload lots, $55 is asked.

SPELTER.—The market continues practically unchanged and prime Western grades are held at 4.95c to 4.97½ in carload lots.

MUCK BAR.—There has been some inquiry in the past few days which will no doubt result in buying shortly. Eastern iron is also being offered here and the market continues low at $33 to $33.25.

SKELP.—The market continues quiet, grooved and sheared iron skelp being quoted at 1.92½c to 1.95c and sheared at 1.95c to 2c.

RAILS AND TRACK MATERIAL.—The offerings of light rails still continue large, although there is considerable buying owing to the attractive prices prevailing. The demand for the intermediate rail sections from 35 to 40 pounds is large. We make the following quotations: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 16 pounds and 20 pounds, $36; 25 to 40 pounds, $34 to $34.50. Track materials: Spikes, 2.15c to 2.25c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c.

BARS.—The new business in steel bars continues large, although jobbers are not specifying as heavily as a year ago. The demand for iron bars is also good and the market is very firm. We quote: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c, Youngstown, or 1.84¼c, Pittsburg, with freight added to point of delivery from Youngstown. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

PLATES.—The plate situation continues strong and unchanged. The amount of new business that is being placed is large and the mills continue behind on their orders. Quotations are unchanged as follows: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.75c; marine, ordinary, fire-box, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive fire-box, not less than 2.10c, and it ranges in price to 3c. Plate more than 100 inches, 5c extra 100 pounds. Plate 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

STRUCTURAL MATERIAL.—No less than seven bridges are to be built in this district during the present year. The Union Steel Co. will erect a bridge across the Monongahela river at Donora, to connect the P. & L. E. railroad with its new coal road, the contract for which is yet to be placed. The Clairton Steel Co. is building a bridge across the Monongahela at Clairton, the contract being awarded about six months ago, but the steel work is not yet in place. The Jones & Laughlin Steel Co. will erect another bridge across the Monongahela river; while the Pennsylvania and Wabash railroads will build bridges across the Allegheny river and will place contracts shortly. In addition the Wabash is erecting a bridge across the Monongahela and will also award the contract soon for a bridge across the Ohio river near Wheeling, W. Va. In addition the Tenth Street bridge across the Monongahela is to be replaced this year with a modern structure, while the War department has ordered the erection of a new structure across the Allegheny at the confluence of the latter with the Monongahela to replace the old structure erected years ago. The new bridges, for which contracts have not been let, will require fully 40,000 tons of material, while the superstructures of the bridges under erection require about 20,000 tons. The market continues unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

PIPES AND TUBES.—The amount of new business placed continues unusually large for this season of the year and the largest producer is operating all mills at their fullest capacity. Work on the new tube mill at Sharon, Pa., has been stopped entirely and the work of dismantling it will commence shortly. That this mill would be dismantled was announced in these columns some time ago. The market continues very firm. Prices on carload lots, plus the freight to destination, are as follows:

MERCHANT PIPE.

	Steel		Guaranteed Wrought Iron	
	Black Percent.	Galv. Percent.	Black Percent.	Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	66	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	73	63	70	60
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	69	57	65	54
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	70	58	66	55
Extra Strong Plain End				
⅛ to 8 inch	69	59	65	55

Threads only—Same as Plain End, plus 1¼ percent net.
Threads and Couplings—Same as Plain End, plus 2½ percent net.

Double Extra Strong Plain End				
⅛ to 8 inch	61	51	57	47

Threads only—Same as Plain End, plus 2 percent net.
Threads and Couplings—Same as Plain End, plus 3 percent net.

NOTE: Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.
Steel.

	Percent
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 12 inches	55½

Iron.

	Percent.
1 to 1½ inches	80½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3¼ to 4 inches	60
4¼ to 12½ inches	62

SHEETS.—The demand for black sheets continues to improve, but concessions continue to be made by some of the independent producers of $1 to $2 per ton. Black sheets in 500-bundle lots and over are quoted as follows: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.60c; No. 18, 2.85c; No. 26, 3.35c; No. 27, 3.60c; No. 28, 3.85c; No. 29, 4.35c; No. 30, 4.50c.

WIRE AND WIRE NAILS.—The demand for wire products continues strong, but no change in prices has yet been announced. We make the following quotations: Wire nails, carload lots, to jobbers f. o. b. cars, Pittsburg, $1.90; plain wire, carload lots, $1.80; barb wire, carload lots, $2.20; staples, carload lots, $2.10. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.10, and less than carload lots, $2.15 f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.20 in carload lots and $2.25 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

MERCHANT STEEL.—A fair amount of new business continues to be placed in shafting, but the demand for cold rolled stock generally is not so large as the mills would desire. We make the following quotations: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots; tire steel, 2.15c to 2.25c; spring steel 2.25c to 2.35c; toe calk, 2.30c to 2.40c. The following differentials maintain: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Tool steel is quoted 7 cents and upwards, according to the grade.

OLD MATERIAL.—Heavy melting stock continues in great demand, but the offerings are limited and are not nearly large enough to meet the demands of the mills. Carload lots for prompt shipment are selling at $22, while large lots for future deliveries are held at $21.50. Cast scrap is also firm and much in demand at $20.50 to $21. Our quotations, gross tons, are as follows: Heavy melting stock, $21.50 to $22; low phosphorus melting stock, $25 to $25.50; steel rails, $21 to $21.25; re-rolling rails, No. 1 cast scrap, $20.50 to $21; borings, $11 to $11.50; busheling scrap, $17.50 to $18.50; old iron rails, $24.50 to $25; turnings, $15 to $15.50.

COKE.—The coke market continues high, and both foundry and furnace grades for prompt delivery are in strong demand. Foundry coke for prompt shipment is quoted at $6.50 to $7, and furnace coke at $5.50 to $6. Coke producers are not considering offerings covering requirements for the second half of the year, preferring to wait in anticipation of higher prices than for the first six months of the year. New coke oven building is not progressing as fast as is desirable owing to the scarcity of fire brick, while premiums are being asked for the sinking of coal mine shafts. For the week ending Saturday, Feb. 7, the production of the upper Connellsville region reached 240,670 tons, and that of the lower region, 49,000 tons, a slight gain over the production of the previous week.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, Feb. 17.

Market conditions continue strong, though buying has not been very heavy. In pig iron, it has been limited to small lots for shipment within 60 days to 90 days. Delayed shipments due to the congestion of traffic on all railroads have stimulated the demand for spot iron, and inquiries have been numerous during the week under review. There has been a good demand for finished material, but owing to the crowded condition of mills, a large tonnage has had to be turned down. The local plate mill is sold ahead as far as November, and several good-sized orders have been placed with Eastern mills because of the inability of purchasers to get satisfactory deliveries. Spikes, bolts and nuts have been in good demand, and Western producers report that they cannot guarantee deliveries on new business within four to six months. It is noteworthy that orders for heavy rails in lots of 1,000 to 10,000 tons continue to be placed quite freely by electrical railroads, while the demand for light rails has been correspondingly brisk. Sheets are quiet and structural steel is also light, though specifications for the latter are large and numerous. A good business has been done in merchant pipe and boiler tubes, but the inefficiency of transportation facilities is seriously impeding shipments. The scarcity of coke and coal, growing out of the railroad embargo, created a temporary shortage of billets and necessitated the shut down of a rod mill and two wire mills at Joliet last week for three or four days. These mills have since started up again, however. We note the sale several days ago of 3,000 tons of wire rods to an Illinois mill at $37.50 Chicago, and of 2,000 tons of German basic Bessemer billets in the past week to an Eastern concern. The impending combination of Western bar iron mills has resulted in a firmer market on this product, and prices have an upward trend. Buying of both iron and steel has been of good proportions, many concerns sending in supplementary orders for large tonnages. The options on the bar iron mills that will be absorbed by the new company expire Feb. 21, and the promoters of the combination report that the deal in all probability will be consummated by that date. There is no improvement in the local coke supply, and consumers find themselves hard pressed to acquire a sufficient quantity to keep their plants in operation.

PIG IRON.—The freight deadlock remains the dominating feature of this market, and largely upon its removal hinges the advent of the buying movement which has been anticipated so long. So far the railroads have proven utterly incapable of mastering the situation, and the heavy snowfall of Saturday and Sunday has served only to complicate matters. The blockades are reported more frequently from Southeastern transfer points, and a number of Southern furnaces are facilitating their deliveries by shipping iron through St. Louis. The Norfolk & Western and the Chespeake & Ohio are the latest railroads to serve notice on shippers along their lines that for the present freight would not be accepted for transfer to Western roads. These embargoes, coupled with the abnormally long time required for iron en route to reach its destination, have created a brisk demand for spot iron, and metal on track finds a ready sale and at a good premium. Sales made in the past week have all been for delivery within two to three months. There have been no big lots disposed of, 1,000 tons of No. 2 foundry being the largest individual sale. The bulk of the week's transactions was in lots from 500 tons to carloads, the latter predominating. Melters have manifested more interest during the week for third quarter needs, but as a general rule the inquiries were withdrawn as soon as quoted upon. Several sales are reported to have been made below official prices, among them being 500 tons of No. 2 foundry at $18 Birmingham, deliveries to be made in the first half; 500 tons of No. 3 foundry for February delivery at $17.75 furnace. A quotation of $23 Chicago, was made on 1,000 tons of malleable Bessemer for delivery in the third quarter, and refused by the intending purchaser. Standard Bessemer for quick shipment has been sold at $23.75 Chicago. There has been a good demand of the latter grade of iron owing to the scarcity of malleable Bessemer. Charcoal and high silicon irons have found a number of purchasers, but the total sales were not heavy. Iron on track is offered at $23.35 to $23.85 Chicago. We quote as follows:

Lake Superior Charcoal	$26 50 to 27 50
Local Coke Foundry No. 1	23 50 to 24 50
Local Coke Foundry No. 2	23 00 to 24 00
Local Coke Foundry No. 3	22 50 to 23 50
Local Scotch Foundry No. 1	24 00 to 24 50
Southern Coke No. 1	22 85 to 23 85
Southern Coke No. 2	22 35 to 23 85
Southern Coke No. 3	21 85 to 22 85
Southern Coke No. 4	21 35 to 21 85
Southern No. 1, soft	22 85 to 23 85
Southern No. 2 soft	22 85 to 22 85
Southern Gray Forge	21 85 to 21 85
Southern Silveries (according to silicon)	26 15 to 28 15
Jackson Co. Silveries, 6 to 8 percent silicon	22 20 to 23 20
Ohio Strong Softeners	26 80 to 26 80
Alabama and Georgia Car Wheel	27 35 to 28 35
Malleable Bessemer	23 50 to 24 50
Standard Bessemer	23 20 to 24 80

BARS.—The strength of the market in bar iron and steel is shown in the fact that consumers generally are notifying mills that their needs will require the supplementary tonnages specified in their contracts. A good business in both products has been booked during the week, and specifications were larger than for some time past. The price of bar iron is stiffening, which is largely the result of the impending combination of Western bar iron mills. This deal is expected to be consummated the latter part of this week. Hoops and soft steel angles are in good demand, the latter being very scarce. Heavy steel rounds are also scarce, and we note the sale of 3,000 tons of sizes 3½ inches to 7 inches, deliveries to commence in March, at 1.85c Chicago base. We quote as follows: Mill shipments, Chicago delivery, Bessemer steel, 1.76½c; hard steel angles, less than 3x3, 1.86-½c base; soft steel angles, 4x4 and less, 2.10c; hoops in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c; iron, 1.81½c to 1.86½c. Store prices are as follows: Steel, 2c to 2.10c; iron, 2.15c to 2.20c; hoops, 2.40c to 2.50c; angles, 2.25c to 2.50c rates.

SHEETS.—The market is quiet, and reports are current of reductions from official prices. There has been a fair demand in small lots of both black and galvanized sheets from store. We quote No. 27 Black, 2.76½c to 2.86½c; No. 28, 2.86½c; No. 28, 2.86½c to 2.91½c; galvanized, 3.35c to 3.45c. For deliveries from stock, No. 27 Black, 2.95c to 3c; galvanized, 70 and 7 to 75 and 7½ or 3.70c to 3.80c net.

STRUCTURAL STEEL.—For small lots from mill, there has been a good demand, though large orders are conspicuous by their absence. Specifications have been large however. Figures are being taken on a building to be erected in this city requiring about 2,500 tons of structural shapes. Store trade has been very active. We quote mill prices, Chicago delivery; Beams, 15 inches and under, 1.75c to 2c; 18 inches and over, 1.85c to 2.10c; universal plates, 1.75c to 2c; angles, channels and tees, 1.85c to 2c base. The maximum quotation is asked by some mills on small lots for quick delivery. On lots from store, cut to length, we quote 2¼c to 2½c per pound.

PLATES.—A large tonnage was refused last week by the local mill owing to its inability to guarantee early deliveries, the bulk of which was placed with Eastern mills. Business in the past week has been heavy, the South Chicago mill having sold its capacity as far ahead as November. We quote mill shipments, Chicago delivery, as follows: Tank steel, ¼ inch and heavier, 1.75c to 1.95c base; flange steel, 1.85c to 2c base. Prices from stock, tank steel, ¼-inch and heavier, 2.25c to 2.35c; 3-16, 2.25c to 2.40c; Nos. 8 and 10, 2.40c to 2.50c; flange steel, 2.50c to 2.60c.

RAILS AND TRACK SUPPLIES.—There is a good demand from electrical roads for heavy rails in lots ranging from 1,000 to 10,000 tons. Light rails have also sold heavily. The leading local producer of spikes, bolts and nuts, reports that the heavy buying of these products of recent weeks has taken their capacity for several months ahead, and that it will shortly be compelled to withdraw from the market on the same. We quote heavy rails, $28; second quality, $27; light rails, 45 pounds, $34 to $35; 12 pounds, $40 to $41, with regular differentials for intermediate sizes. Track supplies, mill shipments are quoted as follows: Angle bars, 2c to 2.10c; spikes, first quality, 2.25c; (out of store 2.40c to 2.50c rates); second quality, 2.15c; track bolts, 3½x¾, with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3.05c to 3.15c, with usual differentials for other sizes.

MERCHANT STEEL.—More as a courtesy to buyers, mills continue to accept small orders for such deliveries as they can give within the next six months. These orders are selected, and the tonnage consequently is limited. Specifications are large, but owing to the congestion of traffic, railroads are not moving cars rapidly. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots 5 to 10 percent higher; cold rolled shaftings, carload lots, 47 percent off; less than carload lots, 42 percent off.

MERCHANT PIPE.—There is no diminution to be noted in the demand, which continues extremely heavy. A number of big jobbers placed contracts in the past week, greatly augmenting the aggregate tonnage. Mills report that their customers are complaining severely of the delays to cars en route. We quote prices to consumers, mill shipments, carload lots, random length, f. o. b. Chicago, as follows:

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¾ in inclusive	66.35	56.35	68.35	58.35
½ inch	68.35	58.35	65.35	55.35
¼ to 6 inches, inclusive	73.35	63.35	70.35	60.35
7 to 12 inches, inclusive	71.35	61.35	68.35	58.35

Less than carload lots, 12½ percent advance over above prices.

BOILER TUBES.—There has been a good demand both from mill and store, but the former report they are still handicapped in their shipments by the failure of railroads either to provide a sufficient quantity of cars or to move freight quickly. We give below quotations for carload lots, mill shipments, f. o. b. Chicago. Less than carload lots from mill, 12½ percent is to be added.

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in	43.35	38.35
1¾ to 2½ in	55.85	35.85
2¾ to 5 in	60.85	45.85
6 to 13 in	55.85	35.85

For lots direct from warehouse stock:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in	35	35
1¾ to 2½ in	47½	32½
2¾ to 5 in	55	42½
6 to 13 in	47½	32½

CAST IRON PIPE.—There has not been a very heavy demand during the week, sales being confined to the usual run of small orders that come in the days' mails. The leading producer reports that its shipments to California and other Western points are seriously delayed owing to the car shortage. We quote f. o. b. Chicago, 4-inch water pipe, $34; 6-inch, $33; 8-inch and upwards, $32; gas pipe, $1 a ton higher.

BILLETS AND WIRE RODS.—The scarcity of coal and coke, creating a shortage in billets, resulted in the shutting down for three or four days last week of a rod mill and two wire mills at Joliet. All have since started up again. We note the sale of 3,000 tons of wire rods at $37.50, Chicago, several days ago to a Western mill, and last week of 2,000 tons of German basic Bessemer billets. Domestic rods and billets are extremely scarce, and the probabilities are that for several months to come no more will be obtainable in this market. We quote rods, $37.50 Chicago; Bessemer billets, $31.50; small lots from stock, 4x4, $40; open hearth billets for forging purposes, $36 to $38; for use in rolling mills, $32.50 to $33. German basic Bessemer billets, Chicago delivery, $30.50 to 31. Special carbons higher.

WIRE NAILS AND FENCING.—As referred to elsewhere, the leading producer was compelled to shut down two of its wire mills last week owing to a scarcity of wire rods, putting them behind to some extent in shipments. There is some talk of an advance in wire products next month, but no definite action has been taken as yet. The demand for nails and fencing is very heavy, coming from all parts of the country, buyers generally increasing their orders over those placed last year. We quote prices to jobbers, Chicago delivery, as follows: Plain wire, carloads, $2; smaller lots, $2.10; galvanized, $2.30 in carloads, and $2.40 smaller lots. Barb wire is $2.40 in carloads, and $2.50 in less than carloads; galvanized, $2.70 in carloads, and $2.80 in lesser lots. Staples are $2.20 carloads, and $2.35 smaller lots. Wire nails, $2.10 carloads, and $2.20 smaller quantities; cut nails, $2.26½ carloads, and $2.36½ less than carloads. Poultry netting to jobbers, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds; to retailers, 80 and 20 percent off.

COKE.—The supply of coke in this market continues far below the requirements, though a number of shippers report that the railroads did a little better last week than for some time preceding. Except for fuel on track, there is no buying, sell-

ers as a general rule, preferring not to obligate themselves further in the matter of contracts until the railroad situation improves. We quote Southern coke, immediate shipment, $9.50 to $10; Connellsville, $10 to $10.50.

OLD MATERIAL.—The status in the scrap market is unchanged. Mills are not in the market, and dealers are not pressing material on them. Prices continue to hold up well. We quote gross tons as follows:

Old iron rails	$23 50 to 24 00
Old steel rails (mixed lengths)	18 00 to 18 50
Old steel rails (long lengths)	22 00 to 22 50
Relaying rails	31 50 to 32 00
Old wheels	23 00 to 23 50
Heavy melting steel	17 00 to 17 50
Mixed country steel	15 00 to 15 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$19 50 to 20 00
No. 2 R. R. wrought	18 00 to 18 50
Shafting	19 00 to 19 50
Dealers' forge No. 1	16 50 to 17 00
No. 1 busheling and wrought pipe	14 00 to 14 50
No. 1 cast	16 50 to 17 00
Railway malleable	15 50 to 16 00
Country malleable	14 50 to 15 00
Iron axles	23 50 to 24 00
Steel axles	19 50 to 20 00
Cast borings	10 00 to 10 50
Mixed borings, etc	9 50 to 10 00
Wrought turnings	13 50 to 14 00
Machine shop turnings	13 00 to 13 50
Iron axle turnings	14 00 to 14 50
Steel axle turnings	13 50 to 14 00
Stove plate and light cast scrap	12 50 to 13 00
Old iron splice bars	21 00 to 21 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Feb. 18.

The prices for ore this year have not yet been fixed. The delay is not due to differing views of the various interests represented, but is caused by the fact that additional time is required to collect important information, never before compiled, as to the relative value of certain grades of ores. This thorough investigation is deemed necessary to the establishing of differentials which will be just to all concerned. It is the expectation of the producers of Mesabi ores that their product in the future will take a position in the market more closely representing actual values, based on analysis and physical properties. It would seem that discrimination against Mesabi ores purely because they are from that range, is not likely to continue, and that a Mesabi ore as good chemically and physically as a given old-range ore will bring as high a price.

COKE.—The snow and very cold weather of the past three or four days have increased the embarrassments of the railroads and a number of foundries in Cleveland and vicinity have been compelled to shut down on account of coke shortage. One sales agent who required 32 cars to supply his customers Tuesday received only two. Hundreds of cars of coke are on side tracks, where some of them have been since the close of the old year. Spot foundry coke, if obtainable at all, is sold at $7 to $7.50, while $5.75 is the price for the first half.

PIG IRON.—There is marked improvement in the market. While no large sales are reported, one agency has sold within a week 1,000 tons for the second half and 1,500 tons for the first half. For the last half the price is $21 at the furnace for No. 2 Northern, excepting Southern Ohio iron, which commands $22. There is very little difference now between prices for spot and for the first half, spot in the Valley having sold as low as $22 for No. 2, which would be $22.85, Cleveland. It is very difficult to get strictly spot iron, partly because there is very little on the market and partly because railroads are unable to deliver promptly. While iron comes from Southern Ohio with reasonable promptness, delivery from the Birmingham district is very slow, some cars having been two months en route recently. We quote as follows, f. o. b. Cleveland, for shipments in the first half of 1903:

Bessemer	$21 85 to 22 35
No. 1 Strong Foundry	23 00 to 23 50
No. 2 Strong Foundry	22 50 to 23 00
No. 3 Foundry	21 75 to 22 25
Scotch No. 1	23 00 to 23 50
Scotch No. 2	22 50 to 23 00
Gray Forge, Valley	20 00 to 20 25
Lake Superior charcoal	26 50 to 27 50

FINISHED MATERIAL.—Barring the complaints about poor delivery by railroads, present conditions are very satisfactory. Demand for nearly all kinds of finished material is strong and the outlook is that it will be even stronger. Mills have added to their equipment and are in better shape to take care of orders, which are reported to be in excess of those at this time last year. One of the largest producers, outside of the United States Steel Corporation, reports that orders are coming in in a most gratifying manner, but that it has not been able to get cars and motive power to move more than one-fifth of the material sold. The bar iron market is somewhat unsettled, as buyers are still hoping that the price of 1.80c, Youngstown, will not be maintained, but indications are that it will be, for some time, at least, in spite of competition from Western mills. Only a fair amount of business is being done in bar iron, but sales of steel at 1.70c for open-hearth and 1.60c for Bessemer, Pittsburg, are brisk. The demand for plates is very strong and premiums as high as $6 per ton are reported for prompt delivery. Agreement quotations on structural material are as follows: Beams and channels, 3 to 15 inches, 1.70c; 18 to 24 inches, 1.80c; tees, 1.75c; zees, 1.70c; angles from 3 to 6 inches, 1.70c; universal mill plates, 1.70c. There is no change in the sheet situation, prices in competition being about $2 per ton below those of the last official announcement of the principal producers, which through jobbers are as follows: For 3-16-inch sheets and heavier, 2.15c, Cleveland. Mill sales of black sheets, Cleveland, to consumers: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c; and the following prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.55c to 2.70c; Nos. 18-20, 2.75c to 2.90c; Nos. 22-24, 2.85c to 3c; Nos. 25-26, 2.95c to 3.10c; No. 27, 3.05c to 3.20c; No. 28, 3.15c to 3.30c. On galvanized sheets we quote mill sales in carload lots, Cleveland, as follows: Nos. 10 and 11, 2.60c; Nos. 12-14, 2.70c to 2.85c; Nos. 18-21, 3c to 3.15c; Nos. 22-24, 3.30c to 3.45c; Nos. 25-26, 3.55c to 3.70c; No. 27, 3.80c to 3.95c; No. 28, 4.05c to 4.20c; No. 29, 4.45c to 4.60c; No. 30, 4.95c to 5.10c. Galvanized sheets out of stock are quoted at 75 and 2½ off.

OLD MATERIAL.—There is a very fair demand for nearly all kinds of scrap, machine cast being very strong, while steel works are scouring the country for heavy melting stock. Prices are firm and unchanged. We quote Cleveland delivery, all gross tons, as follows:

Old iron rails	$24 00 to 25 00
Old steel rails (over 6 feet)	22 00 to 23 00
Old steel rails (6 feet and under)	20 00 to 20 50
Old car wheels	22 50 to 23 00
No. 1 R. R. wrought scrap	21 00 to 21 50
Mill scrap	19 00 to 19 50
No. 1 machine cast scrap	21 00 to 21 50
Iron axles	29 00 to 30 00
Steel axles	28 00 to 29 00
Axle turnings	18 00 to 19 00
Wrought turnings (free from cast)	16 00 to 17 00
Cast borings	11 00 to 11 50
Uncut wrought iron boilers	12 00 to 13 00
Steel boiler plates	17 00 to 18 00
Grate bars	12 00 to 13 00
Pipes and flues (clean)	17 50 to 18 50
Tank iron	17 00 to 18 00
Hoop and band iron	13 50 to 14 50
Sheet iron	12 00 to 13 00
Wrought drillings	15 50 to 16 50
Malleable iron (railroad)	19 50 to 20 00
Malleable iron (agricultural)	17 50 to 18 00
Stove plate	16 00 to 17 00
Heavy steel	19 00 to 20 00

CINCINNATI.

Feb. 17.

The general situation shows no important change. It was with a sense of relief that the trade received word that at a meeting of the Southern freight agents at Atlanta this week it was decided not to advance rates on Southern pig iron. The coke market is easy in tone, but inability to move the coke from the ovens holds the spot or quick shipment market firm. We quote spot foundry coke $8 to $8.50 f. o. b. Cincinnati. The railroad situation is most aggravating and a large part of the correspondence in the pig iron sales agents' offices is in regard to delayed shipments.

PIG IRON.—It has been another quiet week. Sales are still in small lots of from carloads to 100 tons, and buyers show no more inclination to come into the market for their future wants than they have shown for the past month. In regard to prices the market may be called steady. A few scattering lots of No. 2 foundry are being sold at $18 to $18.25 Birmingham, but the $18.50 schedule is being maintained as a rule. It is becoming more difficult now to sell spot or quick shipment iron, for the reason that no certainty or reasonable promise as to deliv-

ery can be relied upon. Buyers have had so much difficulty in getting forward iron purchased to piece out, while waiting for deliveries on contracts, that they are not taking much in this way now. In gray forge the situation is unchanged. Sellers quote $16.50 to $17.00, Birmingham. Some ask $17.50. Buyers are holding off and talk $15.50 to $16, with no business resulting. The feeling in the trade is that a buying movement is due. Many contracts were made last year covering the first quarter of 1903, and that period will soon be passed. It is believed that these buyers will soon show more interest in the market and provide themselves with a steady supply. In the meantime nothing can be gained by urging iron and prices are maintained. While it is true that stocks of pig iron have shown some gain at the furnaces, it is claimed that these stocks are mostly sold and are only waiting cars. We make no change from prices quoted last week for quick delivery and first quarter of 1903, f. o. b. Cincinnati:

Southern Foundry No. 1	$22 50 to 23 00
Southern Foundry No. 2	21 75 to 22 25
Southern Foundry No. 3	20 75 to 21 25
Southern Foundry No. 4	19 75 to 20 75
Southern Foundry No. 1, soft	22 50 to 23 50
Southern Foundry No. 2, soft	21 75 to 22 25
Gray Forge	19 75 to 20 75
Northern Foundry No. 1	22 00 to 23 00
Northern Foundry No. 2	21 00 to 22 00
Southern car wheel iron	28 25 to 28 75

FINISHED MATERIAL.—The demand in the lighter lines shows improvement. Orders are larger and buyers show more disposition to take more than enough for current needs. Prices are steady, although there are still bargain lots here and there. Prices for bar iron in carload lots are: 1.90c base, half extras f. o. b. Cincinnati; steel bars, 1.73c base, half extras f. o. b. Cincinnati. Both are retailed at 2.20c base, full extras out of store. Sheets are in fairly active demand and steady. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.10c; No. 27, 3.00c; No. 16, 2.70c; No. 14, 2.60c; No. 12, 2.50c; No. 10, 2.40c. Galvanized sheets in car lots sell at 75 and 10 percent off; less than car lots, 70 and 10 percent off. Tank plates are firm and sell out of store at 2.25c for ¼-inch and 2.35c for 3-16-inch. There is a fair demand in a retail way for structural shapes and prices are well maintained. Beams and channels are quoted at 2¼c to 2¾c from stock, and angles at 2.15c to 2.25c for base sizes. Business in merchant pipe is active, and the market is irregular. The leading interest is getting more of the business now than for several weeks, which is attributed to independents having taken all of the business they could care for and being so filled up with orders that they were forced to turn business away. Prices are variable. For some sizes independents quote above the schedule, while for others they quote under, but there is a good general demand and a good volume of business moving. Merchant pipe and boiler tubes are quoted as follows for carload lots f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜-inch	66.8	56.8	63.8	53.8
½-inch	68.8	58.8	65.8	55.8
¾ to 6-inch, inclusive	73.8	63.8	70.8	60.8
7 to 12-inch, inclusive	71.8	61.8	68.8	58.8

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ in.	43.8 & 5	38.8 & 5
1¼ to 2½ in.	56.3 & 5	36.3 & 5
2¾ to 5 in.	61.8 & 5	46.3 & 5
6 to 13 in.	56.3 & 5	36.3 & 5

OLD MATERIAL.—The demand continues good and the market is active and steady. Old No. 1 wrought railroad is a shade easier, while some descriptions are slightly firmer. We quote:

Old No. 1 wrought railroad, net tons	$18 50 to 19 00
Cast machine and foundry, net tons	17 00 to 17 50
Old iron rails, gross tons	22 50 to 23 00
Old steel rails, gross tons	21 50 to 22 00
Old short lengths, gross tons	17 50 to 18 00
Old iron axles, net tons	27 00 to 27 50
Old chilled car wheels, gross tons	22 00 to 22 50
Stove plate, net tons	11 50 to 12 00
Wrought turnings, net tons	15 00 to 15 50
Cast borings, net tons	12 00 to 12 50

PHILADELPHIA.

Feb. 17.

The congestion at railroad centers is a very important factor in present conditions, as it curtails the output of furnaces and mills and delays delivery of fuel and all kinds of finished material. While prices might be lower if railroads were able fully to meet all demands, there is no prospect that they will be able to do so this winter. There is no abatement in orders and inquiries indicate that business in the spring will be brisk. Most buyers of pig iron are still indisposed to buy for the second half.

PIG IRON.—Inquiries from mill interests for a large amount of forge iron have not resulted in orders, in view of inability to agree as to prices, but the general market has a better tone with prospects of considerable activity in the near future. Sales are still for nearby requirements, but are more numerous than during January. We quote: No. 1 X foundry, $23.50 to $24; No. 2 X foundry, $22.50 to $22.75; No. 2 plain, $21.50 to $22; gray forge, $20.50 to $21; Middlesboro No. 3, $21 to $21.50; Scotch, $22.50 to $23.50.

BILLETS.—Domestic steel is scarce and foreign is about a dollar higher than 10 days ago. Contracting is delayed. Prices depend to a large extent upon date for delivery, being $31 to $32 for domestic and $27.50 to $29 for foreign.

FINISHED MATERIAL.—The tendency is toward improvement, but there is no important change. The amount of business in sight is encouraging. Prices are unchanged, as follows: Plates, small lots, 2.10c to 2.15c; carload lots, ¼-inch and thicker, 2c to 2.05c; universals, 2c to 2.05c; flange, 2.10c to 2.20c; firebox, 2.25c to 2.30c; marine, 2.30c to 2.35c. Steel bars, 1.80c to 1.90c; prompt shipments from local mills; Western steel, 1.75c to 1.80c; bar, iron, 1.93½c to 1.98½c, for carload lots as minimum quantity. Structural material in small sizes is quoted 1.73½c to 1.80c; large sizes, 1.90c to 2.10c.

OLD MATERIAL.—There is a good demand, particularly for melting scrap, with prices firm, as follows: Old steel rails, $20.75 to $21.25; miscellaneous heavy steel scrap, $20.25 to $20.75; low phosphorus scrap, $26.50 to $27.50; old steel axles, $25.50 to $26.50; old iron axles, $29.50 to $30; old iron rails, $23.50 to $24; old car wheels, $22.50 to $23.50; choice scrap, railroad No. 1 wrought, $23 to $24; country scrap, $20 to $21; machinery cast, $19.50 to $20.50; No. 2 light scrap (forge), $18 to $18.50; No. 2 light scrap (ordinary), $14 to $15; wrought turnings, $16 to $16.50; wrought turnings, choice heavy, $16.75 to $17.50; cast borings, $10.50 to $11; stove plate, $15 to $16.

BIRMINGHAM, ALA.

Feb. 17

The iron market is quieter than it has been for some months. Some transactions involving no very large tonnage have taken place the past week or so; but from what can generally be learned, very little business has as yet been booked for the last half of the current year. In the meantime, the present product of the furnaces is being applied as rapidly as made on old contracts, on which urgent demands are being made for faster shipments. Gray forge is still held at $17 to $17.50 at the furnaces, with No. 2 foundry at $18.50, and No. 1 foundry and No. 1 soft at $19.50 to $20. Some sales of No. 2 have been made, however, as low as $18.

Coal and coke continue in great demand, with prices firm at the figures which have ruled for 90 days. With the advent of better weather, additional ovens will be put in commission and coke should be in better supply at lower prices. However, owing to excessive rains the past few weeks, construction work of all kinds is practically at a standstill.

The proposed steel plant at Brunswick, Ga., is proving of considerable interest to the Birmingham district. It is expected that if the plans proposed are carried out, the Birmingham district will to a large extent supply the necessary raw material. The Garrett-Cromwell Engineering Co., of Cleveland, has a contract for the erection of blast furnaces, steel works and rolling mill. It is announced from Brunswick that one of the probabilities is a consolidation of the proposed Mohawk Valley Steel & Wire Co. with the Alabama Consolidated Coal & Iron Co., of this place, the Brunswick & Birmingham Railroad Co.,

and the Brunswick Coke & City Improvement Co., with a capitalization of $250,000,000. This report is not given credence here, and it can safely be said has no foundation in fact.

President Thompson, of the Republic Iron & Steel Co., with a party of directors, spent several days in Birmingham the past week. While no official announcement was made as to the particular object of their extended visit, it is believed that arrangements are being perfected for the construction of a steel mill at Thomas.

Quite a number of coal mining companies are being organized. The coal output for year 1902 exceeded by over 10 percent the production of any previous year in the State's history, and with the greatly increased developments now under way the year 1903 should show a considerable gain over 1902.

The Southern Iron Committee at its meeting in Atlanta on Feb. 10 took no action with reference to advancing freight rates. The manufacturers of iron made a strong argument against any further advance, setting forth the fact that the present rates on Southern iron to the Northern and Central West are much higher than rates on foreign iron to the same points.

The Metal Market.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, Feb. 17.

The local situation is unchanged. There is a fair demand for copper, which sells strong at 12½c to 12¾c in carload lots, and 13c to 13¼c in less than carload lots. Pig lead is dull and depressed, though prices remain firm on the basis of 4.05c in 50-ton lots, 4.07½c in carload lots, and 4.10c in smaller lots. Pig tin is without change at 31c. Spelter is fairly brisk at 5c for carload lots, and 5½c to 6c for lesser quantities. Other metals are as follows: Sheet zinc, carload lots, 6¼c, and 6⅜c in 600-pound lots. Antimony, 10¾c to 11c for Cookson's, and 9¾c for Hallett's in small quantities. Selling prices of old metals are as folows: Copper wire, $11; heavy copper, $10.75; light copper, $9.75; red brass, $10.75; yellow brass, $8; light brass, $6.75; lead pipe, 3½c; zinc, 3c to 3¼c.

All work on the erection of the new tube mill of the Sharon Steel Co. at South Sharon, Pa., has been ordered stopped and it is probable that the mill will be dismantled at an early date. The work on the skelp mills is going ahead and it is expected that the first steel will be rolled within a few months.

More than 6,000 tons of wire and wire nails were exported last month through Eastern ports by the American Steel & Wire Co. Australia and South Africa were the principal purchasers of wire. To ports in the first named country 1,237 tons were shipped in January. Four hundred and thirty tons were sent to Buenos Ayres and other Argentina ports; 370 tons to Chile, 298 tons to Brazil, and 541 tons to Europe.

According to the annual report of the chief of the state bureau of statistics of New Jersey, the business in 47 industries increased, and in 37 industries it decreased in 1901 as compared with 1900. The greatest decrease, 16.50 percent, is shown in the manufacture of pig iron, while the mining of iron ore shows a decrease of 16.34 percent.

In a pocket size handbook, with flexible cover, General Manager James M. Swank has gathered together the iron and steel, iron ore and coal statistics of the United States, Great Britain, Germany, France and Belgium. In most cases the statistics begin as far back as authentic data are available. The little volume contains 32 pages and is unique in the amount of valuable statistical matter packed into this small compass. In an introductory note Mr. Swank says that the compilation is presented to the members of the American Iron and Steel Association as a souvenir of the completion by him on Dec. 31, 1902, of 30 years of continuous service, first as secretary and afterwards as general manager of the association.

NEW PLANTS OF THE STEEL CORPORATION.

The appropriation for the erection of a fourth stack at the Ohio plant of the National Steel Co., Youngstown, O., has been made and the erection of the furnace will be immediately proceeded with. The announcement that another stack would be added to this plant was made six months ago, but the time for the starting of the work was left indefinite. The Carnegie Steel Co. will also immediately proceed with the erection of a 140-inch plate mill at its Homestead plant which will have a monthly capacity of 12,000 tons. The American Steel Hoop Co. will also add a 10-inch continuous mill at the upper Union mills at Youngstown, O.

Blast furnace "J" of the Edgar Thomson plant of the Carnegie Steel Co., Braddock, Pa., was blown in on Monday, February 16, 293 days after ground for its erection was broken. The torch was applied by Susan Dickson, the 13-year old daughter of William B. Dickson, of the United States Steel Corporation. Furnace "K," ground for which was broken on the same day as that of furnace "J," was blown in on December 5, 222 days after work was commenced, which is a world's record for the erection of a modern blast furnace stack. The time in which the two plants were erected will no doubt stand as records for some time to come and it is doubtful whether they will ever be eclipsed. When contractors were asked to bid on the construction of the two stacks they stated that they could not possibly complete them in less than a year. As the iron which the two stacks would produce was badly needed it was decided to erect the furnaces under the supervision of John F. Lewis, master mechanic of the plant, under the general supervision of general manager Thomas Morrison. The records best indicate their great work. The stacks each have a daily capacity of 500 tons. The fifth stack of the Carrie group at Rankin, Pa., will be blown in within two months.

Sensational reports have been published recently in daily newspapers concerning a fire at the plant af the Laughlin Nail Co. at Martin's Ferry, O. We are advised that these reports are gross exaggerations and that while the company has had considerable trouble lately occasioned by a fire in the cinder bank under the finishing department in its works, it is not a matter of any very great moment except for the trouble it causes and the time lost in this department, and some little expense connected with putting it out. This fire can only be extinguished by shoveling out the ashes, and that is being done. The story in regard to the trenches being cut around the plant, and the work of the fire department, is not true. There has been only a very small quantity of water used, as this is the kind of a fire upon which water has no effect. There is no possibility of the sheet mill being affected in any way by this fire and this department of the works is in operation at this time, and by the end of this week the company hopes to have its entire works in all departments in operation as usual.

J. B. & J. M. Cornell Co., of Cold Springs, N. Y., has been incorporated to carry on the business of structural iron and steel manufacturing and building, and the manufacture of sugar and molasses making machinery and tools. The capital is $2,000,000, equally divided between preferred and common stock, and the directors are: John M. Cornell, Irwin H. Cornell, of New York city, and Charles R. Leffingwell, of Yonkers, N. Y. The corporation succeeds the well known foundry and heavy machinery firm.

The strike of the limestone quarrymen at Hilltown, near New Castle, Pa., has been declared off and the men have returned to work at the old wages. In a few instances some of the former employes have refused to return to their old places, but the quarries have had no difficulty in filling their places. The output of the quarries is now normal and the furnaces in the Mahoning and Shenango Valleys are securing their full quota of limestone.

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THE DOMESTIC AND FOREIGN SHEET SITUATION.

In a period when American blast furnace, steel works and rolling mill practice has been so nearly perfected it is difficult to realize how the sheet industry stands by itself. In blast furnace and steel works practice, and in most lines of rolling, costs have been so reduced by the magnitude of the operations, and by the introduction of labor saving machinery, that they compare favorably with results obtained abroad. Differences in prices here and abroad are accounted for mainly by the phenomenal prosperity at home, and to a smaller extent by the higher wagees paid. Where the wages per man are much higher, they are made up by vastly increased output, so that the labor cost per ton is not necessarily higher.

In the sheet industry, which of course includes tin plates, the position is radically different. In blast furnaces, steel works, plate mills, merchant mills, rod mills and the like, labor saving machinery has been introduced to a very remarkable extent in the United States, greatly decreasing the number of men employed in proportion to output. In the sheet trade this is distinctly not the case. Where a plate mill roller, for instance, receives larger wages in the United States, his labor is spread over a much greater tonnage. In the sheet trade his wages are also larger, in somewhat the same proportion, but these wages are per ton, wholly irrespective of output. This is natural enough, in so far that the exertion in rolling a ton of sheets is not fundamentally different here from what it is abroad. In practically all other lines there is a fundamental and great difference.

That this anomaly in the American sheet trade is to be overcome within the next few years can hardly be denied. What has been accomplished by improved methods and automatic machinery in less difficult cases will ultimately be accomplished in this case also.

At the present time there is the widest disparity between the United States and England, for example, in the cost of converting a ton of sheet bars into black sheets, galvanized sheets, or tin plate. Without entering into an exact comparison, which would involve a reduction to similar terms of prices figured on very different systems of quotations, it can be said roughly that sheets, black and galvanized, and tin plates, sell in England at some $15 a ton below the lowest prices recently made on similar American products, while sheet bars bring prices roughly $5 a ton below the price at which American sheet bars would sell to give in the finishing operation only a bare profit. This handicap is due mainly to the higher wages per ton paid in the United States, nor can these be largely reduced until the principle is introduced of making the labor much more effective by the introduction of improvements in methods whereby a given amount of exertion is spread over a greater tonnage.

In the last period of comparative depression in the United States foreign markets were invaded with large tonnages of pig iron, steel billets, rails and structural shapes. A wire trade was built up which on account of the particularly great advancement in this line has been retained and even increased where trade in other lines has been reduced. Great Britain has in the same time greatly increased her exports of both black and galvanized sheets and of tin plates to countries other than the United States. She increased exports of galvanized sheets from an average of about 160,000 gross tons in 1891-2-3 to 331,272 tons in 1902. The increase in black sheets cannot be observed, because it is obscured by a classification with boiler plates. Tin plates to countries other than the United States increased from an average of about 145,000 tons in 1891-2-3 to 246,737 tons in 1902.

The markets in which these British products have been sold are not necessarily held by anything but the low price. Of the 331,272 tons of galvanized sheets exported in 1902 about 60,000 tons went to the two American continents, the Argentine Republic alone taking 24,019 tons. Canada took 22,833 tons of tin plates and the Argentine Republic 5,079 tons. These and other markets simply await the same developments in sheet rolling in the United States which American inventive genius and enterprise have introduced into other branches of the iron and steel trade.

THE CENTERING OF PIG IRON PRODUCTION.

Two years ago we made a study of the changes in relative importance occurring in different pig iron producing districts from 1890 to 1900. Such comparisons furnish the most accurate index possible to the shifting of the trade, being based, not on theory, but on actual results achieved. We found in the earlier comparison a general movement towards the greater utilization of Lake Superior ores, a decline in the smaller producing districts, and a larger relative advance in the great districts.

We are now able to make a comparison with the results obtained in 1902. We reproduce our earlier figures, with those for 1902 added. It is somewhat surprising to note that much of the movement of the previous decade has been almost reproduced in the short space of two years. It is not a result which would have been expected on purely theoretical grounds. Last year was one which kept in operation furnaces located in districts which only figure in abnormal times. When

the next depression strikes the trade we may expect radical changes to be shown up by our method of comparison. But for the present we would hardly expect that the state of Virginia, for example, should produce a smaller percentage of the total production in 1902 than in 1900, or even in 1890, but such is found to be the fact. And we find the same movement with West Virginia, Tennessee and New Jersey. Every one of these states produced more pig iron in 1902 than in either 1900 or 1890, and their relative decline is shown up only by a comparison of percentages.

PIG IRON PRODUCTION IN UNITED STATES BY DISTRICTS—LONG TONS:

	1890.	1900.	1902.
Maine	1,071	.....	.....
Massachusetts	4,938	3,310	3,360
Connecticut	20,136	10,238	12,086
New York	329,805	292,827	401,369
New Jersey	158,739	170,262	191,380
Pennsylvania	(4,415,329)	(6,365,935)	(8,117,800)
Lehigh Valley	729,471	545,198	517,950
Schuylkill Valley	541,005	441,118	520,597
Upper Susquehanna Valley	185,002	141,123	3,147
Lower Susquehanna Valley	506,464	538,209	527,794
Juniata Valley	188,330	126,424	198,571
Shenango Valley	597,864	800,214	1,254,933
Allegheny County	1,337,308	3,118,761	4,260,769
Miscellaneous Bituminous	314,561	651,466	829,809
Charcoal	16,320	3,422	4,230
Maryland	147,821	290,073	303,229
Virginia	292,779	490,617	537,216
North Carolina and Georgia	32,025	28,984	32,316
Alabama	816,911	1,154,337	1,472,211
Texas	9,701	10,150	8,095
West Virginia	129,436	166,758	183,005
Kentucky	47,869	71,562	110,725
Tennessee	267,626	362,190	392,778
Ohio	(1,240,330)	(2,470,911)	(3,631,388)
Hanging Rock Bituminous	87,733	244,916	316,566
Mahoning Valley	495,758	1,002,362	1,438,087
Hocking Valley	80,513	50,501	86,194
Lake Counties	.....	497,584	860,371
Miscellaneous Bituminous	552,936	667,811	969,372
Hanging Rock Charcoal	23,390	7,737	10,798
Indiana	14,641	.....	.....
Illinois	701,106	1,363,393	1,730,220
Michigan	230,769	162,712	155,213
Wisconsin	219,855	184,794	273,987*
Missouri	89,777	159,204	269,930†
Colorado	21,061		
Oregon	10,987		
Total	9,202,704	13,789,242	17,821,307

*Includes Minnesota.
†Includes Washington.

PROPORTIONATE PIG IRON PRODUCTION IN UNITED STATES BY DISTRICTS, IN PER CENT:

	1890.	1900.	1902.
Maine	0.0	...	...
Massachusetts	0.1	0.0	0.0
Connecticut	0.2	0.1	0.1
New York	3.6	2.1	2.3
New Jersey	1.7	1.2	1.1
Pennsylvania	(48.0)	(46.2)	(45.5)
Lehigh Valley	7.9	4.0	2.9
Schuylkill Valley	5.9	3.2	2.9
Upper Susquehanna Valley	2.0	1.0	0.0
Lower Susquehanna Valley	5.5	3.9	3.0
Juniata Valley	2.1	0.9	1.1
Shenango Valley	6.5	5.8	7.0
Allegheny County	14.5	22.6	23.9
Miscellaneous Bituminous	3.4	4.7	4.7
Charcoal	0.2	0.0	0.0
Maryland	1.6	2.1	1.7
Virginia	3.2	3.6	3.0
North Carolina and Georgia	0.3	0.2	0.2
Alabama	8.9	8.6	8.3
Texas	0.1	0.1	0.0
West Virginia	1.4	1.2	1.0
Kentucky	0.5	0.5	0.6
Tennessee	2.9	2.6	2.2
Ohio	(13.5)	(17.9)	(20.4)
Hanging Rock Bituminous	1.0	1.8	1.8
Mahoning Valley	5.4	7.3	8.1
Hocking Valley	0.9	0.4	0.2
Lake Counties	...	3.6	4.8
Miscellaneous Bituminous	6.0	4.8	5.4
Hanging Rock Charcoal	0.3	0.1	0.1
Indiana	0.2	...	...
Illinois	7.6	9.9	9.7
Michigan	2.5	1.2	0.9
Wisconsin	2.4	1.3	1.5*
Missouri	1.0	1.1	1.5†
Colorado	0.2		
Oregon	0.1	..	
Total	100.0	100.0	100.0

Increase in production of whole country, 1890 to 1900, 49.8 percent; 1900 to 1902, 29.2 percent.

*Includes Minnesota.
†Includes Washington.

Interest will of course center on the large iron states. We find that the great State of Pennsylvania, which made 48.0 percent of the country's pig iron production in 1890, and declined to 46.2 percent in 1900, experienced a further drop to 45.5 percent in 1902. Looking at the districts in the state, however, the decline is easily located in the eastern part of the state. The upper Susquehanna valley has about dropped out, while the lower has kept about even as to tonnage. The Lehigh, Schuylkill and Juniata valleys have slightly decreased their actual tonnage, and greatly decreased their proportion.

Against these declines in the eastern part of Pennsylvania, there have been almost proportionately large advances in the western part, using lake ores entirely. Allegheny County, which made 14.5 percent of the country's production in 1890, made 23.9 percent in 1902. The tonnage was more than tripled in 12 years, while the country scarcely doubled its tonnage. The Shenango valley increased its relative importance in the same period, in less degree.

In Ohio, the Mahoning valley and the Lake counties increased their relative proportion in a substantial way, and made the whole state more important relatively.

Alabama, which has shown an increasing pig iron production, lost slightly in relative importance from 1890 to 1900, and lost as much more in the two following years. In 1890 the state made 8.9 percent of the country's production, in 1900, 8.6 percent, and in 1892, 8.3 percent.

Broadly speaking, practically every item in our table indicates (1) that the districts using Lake Superior ores are increasing their relative importance in a most marked manner, the change being noteworthy in so short a period of comparison as two years; (2) the districts using local ores are either only holding their own as to actual tonnage, or are declining. It requires no prophetic eye to read from this record, based on exceptionally prosperous years, that these latter districts will not so well stand the strain of adversity.

From 1900 to 1902 the following districts showed increases in actual tonnage: Connecticut, New York, Schuylkill valley, Juniata valley, Shenango county, Allegheny county, Maryland, Virginia, North Carolina and Georgia, Alabama, West Virginia, Kentucky, Tennessee, Hanging Rock (Ohio), Mahoning valley, Lake counties (Ohio), Illinois, Wisconsin and Minnesota and Missouri, Colorado, Oregon and Washington. Of these 19 there were only 10 which showed an advance in relative production, the important ones being the Mahoning valley and the Lake counties in Ohio, and the Shenango valley and Allegheny county in Pennsylvania.

From 1900 to 1902 the following districts showed declines in tonnage of production: Lehigh valley, Upper and Lower Susquehanna valleys, Texas, Hocking valley and Michigan.

The Upper Susquehanna valley practically dropped out in 1902, through the removal of the local interest to Buffalo, N. Y., where production will shortly be on a larger scale, but with Lake instead of local ores.

The directors of the Erie Railroad have decided to issue $10,000,000 in 4 percent fifty year gold bonds, in order to pay for the contemplated improvements which include the construction of second and third tracks, provision of tools and improvements for shops, and the purchase of about 3,000 new freight cars, 50 new passenger cars and 100 new locomotives.

New Construction by the Tennessee Company.

At the annual meeting of the Tennessee Coal, Iron & Railroad Co. this week, the most important announcement made was that contained in President Bacon's report, namely, that the erection of a new and modern blast furnace at Ensley, Ala., will begin at once, and that the program to follow includes the rebuilding and enlarging of four other furnaces at that point. The complete report, which is for the year ending Dec. 31, 1902, is as follows:

To the Stockholders of the Tennessee Coal, Iron & Railroad Co.:

The efforts of your directors and officers have been largely given to the putting of your properties in shape for economical production. Considerable has been accomplished in this direction and much remains to do. Since 1899 this company has owned a furnace plant at Sheffield, Ala., and a comparatively small ore body. Additional boilers, engines and other equipment were needed at the furnaces, but the outlay was not warranted by the ore at command, and to acquire a quantity sufficient to last for many years would have meant a large investment. The distance was too great to permit shipments from your ore mines near Birmingham, and it was necessary to supply coke from the Birmingham district, with a rail movement of 139 miles. Your directors therefore sold your Sheffield property and will use the money toward the erection of new furnaces at Ensley, where both coal and ore are abundant and in close proximity.

It has been decided to erect immediately a large furnace at Ensley, and later to replace four of the stacks now there with others of much greater capacity. The new furnaces will have ample boiler, stove and blowing power; they will have bins for ore, stone and coke, skip hoists, and other labor-saving devices, and will be up to date in design and detail. A water purifying plant has been placed in service at the Ensley furnaces and has reduced the fuel consumption, increased the efficiency of the boilers, and decreased the repairs heretofore necessary. Your Oxmoor Furnaces were idle from March 1901, until November, 1902, since which date one stack has been in blast.

Coke oven gas, which has heretofore been a waste product at nearly all our ovens, is now used to make steam for hoisting and pumping, and will soon steam the boilers that are to run the electric power and light station, now being constructed to supply all our furnaces, mills and shops at Ensley. Generators and motors have been ordered for the equipment of some of your coal mines with electric haulage and light, and at other coal mines, hoists, boilers and compressors are being placed.

Your iron mines on Red Mountain are being equipped almost throughout with compressors and hoists of the best design, the former with power far beyond those now in use, and the latter with rope capacity for hoisting ore from a depth of 4,500 feet. It was found necessary to discard nearly all of the boilers because of their weakness. New boilers, that are ample in power and economical in the use of fuel, are now in place. The water for the supply of the boilers and for general use on the mining locations is pumped for a distance of nearly a mile, and it was necessary to lay pipes of larger capacity than those heretofore in use, and to set up new boilers and pumps. Before the end of the present year these mines will be prepared to make a larger product than heretofore, and at a greatly reduced cost. Machine and blacksmith shops have been erected at the iron mines, in which is now done the work that has heretofore been done at some distance, at great cost, and often at a serious loss, by reason of delay. A number of dwellings have been erected, so that our employes may be more comfortably housed. Hospitals have been built, at which our employes receive as prompt and skillful attention as is provided by the most careful employer. It is the intention to offer the advantages of the hospitals and of the services of the surgeons and physicians to our employes at the Bessemer and Oxmoor furnaces.

On land owned by this company at Greeley, 27 miles from Birmingham, large bodies of brown ore have been opened, and shipments from them to your Birmingham furnaces will be increased. A steam shovel is used for removing the dirt that overlies the ore, which largely reduces the cost. Later, a shovel will be used for mining and a saving effected thereby.

With better methods, a reduction in the cost of mining limestone, amounting to 24 cents per ton, has been effected, and it is believed a further reduction is possible.

At nearly all of the iron mines on Red Mountain new crushers have been placed. The ore supplied to the furnaces is now of proper size, the consumption of coke per ton of pig iron has decreased, a larger percentage of the higher grades of iron is produced, and more uniform furnace operation has been secured.

At South Pittsburg, Tenn., this company owns furnaces, and at Tracy City and Whitewell—the latter is but 18 miles from South Pittsburg—coal mines containing large amounts of coking coal, but no ore supply had been secured, it being the custom to buy ore. A steady supply was uncertain, and the cost was often excessive. Your officers, therefore, bought in November last a tract of land containing sufficient ore to supply for many years the South Pittsburg furnaces, the equipment of which will be strengthened, so that operations may be more economically conducted.

The product of your steel mill has been materially increased, and the errors in design and construction are being corrected as rapidly as possible, but are at large cost both of time and money. During the past month the rail mill has been successfully operated, and we are prepared to furnish rails of all standard sections. Those already rolled are of excellent quality.

Explorations with diamond drills, for the purpose of determining the quantity of raw material owned by this company, are being conducted, the results of which up to date have been satisfactory. The quantity of ore and coal acquired during the past year by the purchase of fee lands is approximately equal to the quantity removed. As stated in my report of last year, for each ton of coal and ore consumed or sold, a sum is charged which will, before the exhaustion of your property, extinguish the value of the real estate as it now appears on the books.

Competent men are giving careful attention to the production of coke, with the result that the percentage of yield has increased, the quality improved, and the quantity consumed per ton of pig iron made has been lessened. Changes and improved practice at several of your furnaces have resulted in the largest and most uniform product recorded.

For full details of the year's business, your attention is called to the attached report of the secretary and treasurer.

DON H. BACON, Chairman.

STATEMENT OF EARNINGS FROM OPERATIONS.

For the Fiscal Year Ending December 31, 1902, compared with 1901.

Net earnings from operation, after payment of all operating expenses, including repairs, renewals and relining, taxes, insurance, administration and provision for bad debts and doubtful accounts		$2,649,063.28		
Balance of interest received on loans and discounts		5,679.25		
Miscellaneous income		2,004.42		
Total profits		$2,656,746.95	Inc.	$931,109.05
Deduct: Interest on bonded debt and dividends on guaranteed securities	$750,283.09			
Deduct: Taxes on unused lands and administration of land department	53,968.08			
		804,251.17	Dec.	57,938.22
Net profit remaining after payment of all charges except depreciation		$1,852,495.78	Inc.	$989,047.27
Deduct: Amount credited to royalty and replacement funds during the year, same being set aside each month out of earnings at a fixed rate per ton on ore, coal and coke produced, and intended to cover depletion of mineral lands and depreciation of coke ovens and of plant and equipment at mines		419,536.82	Inc.	60,302.78
Surplus earnings		$1,432,958.96	Inc.	$928,744.49

PROFIT AND LOSS ACCOUNT.

Surplus earnings (see preceding Statement)..		$1,432,958.96
Add other credits to profit and loss account, viz.:		
Book profit on purchase at discount of guaranteed interest-bearing securities of proprietary companies	$131,350.00	
Profit accruing from sale of Sheffield furnace property above inventory value of same	236,258.51	
Profit realized from sale of investment in Lady Ensley Coal & Iron Co. bonds...	24,828.25	392,436.76
		$1,825,395.72
Deduct premium paid on T. C. I. & R. R. Co. bonds purchased for sinking funds		16,771.25
Balance		$1,808,624.47
Deduct dividends on preferred stock		23,174.66
Net remaining credit to profit and loss account		$1,785,449.81
Which has been applied as follows:		
For new construction: At mines	$707,243.91	
At mills	363,018.32	
At furnaces	194,698.34	
	$1,264,960.57	
And for purchase of mining plant	45,601.89	
Total construction and additions	$1,310,562.46	
For diamond drill and other explorations and for abstracts and surveys	60,924.97	
For additions to office furniture account..	454.33	
Total expenditure for construction, additions, explorations, etc		1,371,941.76
This entire sum has been charged off to profit and loss, leaving a balance of which has been used to further reduce the inventory value of plant account.		$413,508.05

CONDENSED COMPARATIVE BALANCE SHEET.

December 31, 1902, compared with December 31, 1901.

Resources.

	Dec. 31, 1902.	Dec. 31, 1901.	Increase.	Decrease.
Coal and ore lands and other real estate	$26,131,690.66	$26,245,875.56	.....	$114,184.90
Plants and equipment	7,094,023.66	8,012,800.12	.....	918,776.46
Investments	296,799.58	392,470.72	.....	95,671.14
*Treasury securities	615,000.00	8,000.00	$607,000.00	.....
Cash	277,121.28	355,865.37	.....	78,744.09
Bills and accounts receivable	2,019,770.92	1,826,127.64	193,643.28	.....
Inventory of products and supplies on hand	1,312,455.35	1,385,603.66	.....	73,148.31
	$37,746,861.45	$38,226,743.07		$479,881.62

Liabilities.

	Dec. 31, 1902.	Dec. 31, 1901.	Increase.	Decrease.
Cap'l stock, common	$22,552,800.00	$22,552,800.00	.....	.....
Cap'l stock pref'd..	248,300.00	248,300.00	.....	.....
Funded debt:				
Bonds of T. C., I. & R. R. Co. outstanding	12,290,500.00	12,771,500.00	.....	$481,000.00
Less sinking funds.	478,883.77	586,464.06	.....	†107,580.29
Net remaining liability	$11,811,616.23	$12,185,035.94	.....	$373,419.71
Guaranteed Securities of proprietary company:				
Bonds of Alabama Steel & Ship Bldg. Co.	1,100,000.00	1,100,000.00	.....	.....
Pref'd stock, Alabama Steel & Ship Bldg. Co.	440,000.00	440,000.00	.....	.....
Reserve and provisional funds (Including bad debts, reserve, relining and insurance funds, and pro-vision for all accrued taxes.)	268,939.66	231,448.49	$37,491.17	.....
Current liabilities (Consisting of bills and accounts payable, accrued interest and matured coupons unpresented, audited vouchers, pay rolls, etc.)	1,325,205.56	1,469,158.64	.....	143,953.08
	$37,746,861.45	$38,226,743.07		$479,881.62

*"Treasury securities" consist of $370,000 bonds and $237,000 preferred stock of Alabama Steel & Ship Building Co. and $8,000 Cahaba bonds.

†Net reduction of "Sinking Funds" is accounted for by the redemption and cancellation of $155,000 Pratt Coal & Iron Co. bonds by the trustee of that issue out of cash in his hands.

STATEMENT OF WORKING CAPITAL.

Showing Income from all Sources and Disposition of Same.

Working capital December 31, 1901, was....		$2,098,438.03
Viz.: Cash, bills and accounts receivable..	$2,181,993.01	
Inventory of products and supplies on hand	1,385,603.66	
	$3,567,596.67	
Less current liabilities	1,469,158.64	
Add credits to working capital during the year, as follows:		
Net profits for the year, after payment of all charges except depreciation. (See Statement II)		1,852,495.78
Credits to reserve and provisional funds in excess of amounts taken out of same....		37,491.17
Net reduction of cash in hands of trustees of bond sinking funds		107,580.29
Proceeds of sales of lands and timber		33,532.56
Proceeds of sale of Sheffield Furnace plant, Russellville ore lands, Lady Ensley Coal & Iron Co. bonds, and miscellaneous equipment		712,172.98
Total Credits		$4,841,710.81
Less charges to working capital, as follows:		
Expended for new construction and improvements	$1,264,960.57	
Expended for purchase of mining plant....	45,601.89	
Expended for purchase of ore lands.....	65,000.00	
Expended for purchase of coal & other lands	85,124.97	
Expended for surveys and explorations....	60,924.97	
South Pittsburg purchase 6 percent bonds, paid at maturity and retired	120,000.00	
Alice Furnace Co. 7 percent bonds, paid at maturity and retired	206,000.00	
Pratt Coal & Iron Co. 7 percent bonds, purchased for sinking fund and cancelled...	155,000.00	
Premium paid on Birmingham Division, Tennessee Division, De Bardeleben and Pratt bonds, purchased for sinking funds.	16,771.25	
Securities of Alabama Steel & Ship Building Co. purchased, and now held in treasury.	475,650.00	
Investment in proprietary land companies..	38,907.08	
Additions to office furniture account.....	454.33	
Dividends on preferred stock	23,174.66	
Total charges		2,557,568.82
		$2,284,141.99
Balance of working capital, December 31, 1902.		
Viz.: Cash, bills and accounts receivable...	$2,296,892.20	
Inventory of products and supplies on hand	1,312,455.35	
	$3,609,347.55	
Less current liabilities	1,325,205.56	

Lake Superior Iron Mines.

The United States Steel Corporation has found ore at the Forrest mine, near Lake Fuema, Menominee range. This find was made at 300 feet below surface, and the quality of the ore is excellent. The dimensions of the find are not yet known, but more will soon be learned about it. There is considerable water to be handled, about 1,100 gallons per minute, but this will decrease steadily, as the surrounding formation is drained. The pumping facilities are ample.

George J. Eisele has been promoted to the position of assistant superintendent of the company's mines on the Menominee range.

The new twelfth level of the Chapin mine, now being opened up on an extensive scale, is to be provided with an electric railway haulage system. The Chapin will be the first mine on the Menominee range to be equipped with electric haulage.

The new No. 5 shaft at the Aragon mine, Norway, will be equipped with two Prescott pumps. The pumps are 18 and 28 and 47x12x24 inches each, and the duty guaranteed is 1,500 gallons of water against a head of 1,100 feet with 125 pounds steam pressure at the pumps. The hoisting plant for this shaft has also been ordered. The cross-cut from No. 5 shaft to the present workings of the mine has attained a length of 510 feet. The total length of this cross-cut will be about 1,000 feet.

The Buffalo & Susquehanna Iron Co., Buffalo, N. Y., has purchased a lease on property near Iron Mountain, Mich., including the forty on which the Shaw syndicate has done some exploring. It was purchased with a view of supplying the various blast furnaces operated by Rogers, Brown & Co. with their requirements in silicious ore.

The announcement of the discovery of ore deposits, said to be very rich, has been made by C. C. Williams, of Sault Ste. Marie, Mich. Mr. Williams has obtained title to the property, consisting of 1,126 acres, on which the ore was found by explorers in his employ. The land is located about three miles from Wilde station on the Algoma Central railway, thirty miles from the Canada Soo. St. Paul capital is said to be interested in the development of the property.

The British firm of Kerr, Stuart & Co., Burton-on-Trent, have secured the contract for heavy locomotives of the American type for use on the Inter-Oceanic Railway of Mexico. It is stated that many plants in the United States competed, but the British firm offered lower prices and more favorable deliveries.

AMERICAN IRON & STEEL MFG. CO.

The annual meeting of the American Iron & Steel Mfg. Co., of Lebanon, Pa., was held on Feb. 11 and the following directors were elected for the ensuing year: Edward Bailey, Arthur Brock, Horace Brock, Thomas Evans, C. M. Hallman, H. H. Light, James Lord, H. M. M. Richards, J. H. Sternbergh, H. M. Sternbergh, Wm. H. Wallace. The executive officers for the new year are: J. H. Sternbergh, president and general manager, Reading, Pa.; H. M. Sternbergh, vice president, Reading, Pa.; James Lord, manager Lebanon plants; H. M. M. Richards, treasurer, Lebanon; C. M. Hallman, secretary, Lebanon. The statement of assets and liabilities, as of Jan. 1, 1903, is as follows:

ASSETS.

Accounts receivable (trade discount and doubtful and suspended account written off),			$636,744.70
Cash,			188,961.82
Charter and organization account		$186,718.99	
Written off prior to Jan. 1, 1902,	$87,182.41		
Written off for year 1902,	37,296.92		
		124,479.33	
			62,239.66
Inventory at cost			1,548,378.80
Real estate, plant and equipment			4,310,595.87
			$6,746,920.85

LIABILITIES.

Capital Stock:		
Preferred	$3,000,000	
Common	1,700,000	
		$4,700,000.00
Current liabilities, including wages to Dec. 31, 1902		1,281,663.96
Reserve fund (to provide for depreciation)		500,000.00
Undivided profits		265,256.89
		$6,746,920.85

The report of President Sternbergh is given below:

"To the Shareholders of the American Iron & Steel Manufacturing Co.:

"In presenting our financial statement for the year ending Dec. 31, 1902, we have to report that notwithstanding the interruption to our work in the rolling mill departments for nearly six months ending Oct. 20, last, by an unreasoning strike of workmen, and the further embarrassment caused by our extensive building operations, our business for the year as a whole has been quite satisfactory. We have lately had every important item of our accounts critically examined by a certified public accountant and his assistants, covering the entire period from the date of our organization (Sep. 1, 1899) to Jan. 1, last, with the gratifying result that no serious errors have been discovered nor losses incurred, and that the company is in first class condition. In addition to crediting $500,000 to reserved fund account to offset depreciation of buildings and machinery from date of organization to Jan. 1, last, and paying the dividends which have been distributed during the year, we have substantially increased the item of undivided profits.

"The extensive improvements to our Lebanon plants begun more than a year ago have been completed, and we are able to report that our present facilities in the forging and threading departments are very satisfactory in all respects, and we are now able to execute our orders much more promptly and satisfactorily. It is the purpose of the management at a later period when convenient to add a new machine shop and foundry, and to improve the physical condition of the puddling and rolling mill departments of the works at Lebanon, with the view of bringing the entire plant up to the highest state of efficiency."

A. F. A. Meeting at Milwaukee.

The executive committee of the American Foundrymen's Association has decided that the next meeting of the association will be held in Milwaukee the latter part of May or the early part of June. The exact time will be announced at an early date. T. J. Neacy of the Filer & Stowell Co., president of the Milwaukee Foundrymen's Association, will name committees to take charge of arrangements for the meeting.

Five hundred ironworkers—builders, riveters, and feeders—employed by the Chicago Shipbuilding Co., Chicago, went on strike Feb. 5, their demand being ten hours' pay for nine hours' work.

OBITUARY.

Frank A. Lapham, widely known throughout the iron trade of the country, died suddenly in New York on Tuesday, Feb. 17. Mr. Lapham was general sales agent of the Lackawanna Steel Co. and previous to that connection was engaged in a like capacity, first with the National Steel Co. and later with the Tennessee Coal, Iron & Railroad Co. For a number of years he was in charge of sales for the Cleveland Frog & Crossing Co.

William C. Freeman, died Feb. 7 at his home at Cornwall, Pa., after a brief illness. He was 62 years of age. Mr. Freeman was the vice president of the Lackawanna Steel Co., of Buffalo.

Chas. Presbrey, one of the proprietors of the Novelty Iron Works, Sterling, Ill., died Feb. 6, aged 68.

Joseph C. Jones, owner of the Emporia Foundry & Machine Works, Emporia, Kas., died Feb. 5, aged 52.

John Hallett, president of the Hallett Iron Works Co., Chicago, died Feb. 7 in Florida, whither he had gone for his health. He was 72 years old and went to Chicago from England in 1852.

Augustus G. Wood, who for many years was engaged in the foundry business at Camden, N. Y., died Feb. 9, aged 66 years.

Lookout Mountain Iron Co.

The Lookout Mountain Iron Co. held its annual meeting at Birmingham, Ala., last week, following a visit to the company's properties, which are in the Lookout Mountains, between Birmingham and Chattanooga. The town which will be built up at the plant is known as Battelle, Ala., and is on the Alabama Great Southern Railroad. Ore, coal and limestone are so close at hand that assembling costs will be exceptionally low. It is the plan of the company to begin work on its blast furnace as soon as weather will permit. The mining of coal has already started and the manufacture of coke will begin in a few weeks, 300 ovens being under construction. At the meeting of the stockholders last week J. H. Frantz, general manager and treasurer of the Columbus Iron & Steel Co., Columbus, O., was added to the board of directors. The officers were re-elected as follows: Col. J. G. Battelle, of New York, president; Erskine Ramsay, of Birmingham, vice president, and J. F. Steins, secretary and treasurer.

The New Blast Furnaces.

The following are the approximate times now fixed for new blast furnaces to be blown in: Standish furnace of Chateaugay Ore & Iron Co., Standish, N. Y., July; Clairton Steel Co., Clairton, Pa., No. 1 furnace, April 1, No. 2 about June 1, No. 3 about August 1; Sharon Steel Co., Sharon, Pa., No. 2 furnace, May 15, and No. 3 about July 15; Rochester & Pittsburg Coal & Iron Co., Falls Creek, Pa., about July 1; Union Steel Co., Donora, Pa., No. 1 furnace, August 1, and No. 2, September 1; Dover Iron Co., Bear Spring, Tenn., Dover furnace, February; Alabama Consolidated Coal & Iron Co., Birmingham, coke furnace at Gadselin, March 1; Cleveland Furnace Co., Cleveland furnace, July; Toledo Furnace Co., Toledo, May 1; Penn Iron & Coal Co., Canal Dover, O., February; South Chicago Furnace Co., May 1; Detroit Iron & Steel Co., furnace on Zug island, July; Pioneer Iron Co., charcoal furnace at Marquette, Mich., March 1.

The Pere Marquette Ry. Co. has contracted with the American Shipbuilding Co. for two car ferry steamers, to cost $750,000. The steamers will be 350 feet over all, 338 feet keel, 56 feet beam and 19½ feet deep. They will have triple expansion engines, cylinders 19, 31 and 52 inches, with 36-inch stroke. Steam will be furnished by four Scotch boilers, 13 feet 9 inches in diameter and 12 feet long, to be allowed 175 pounds of steam. Each of the steamers will have capacity for thirty-two cars. The boats, which will be operated between Ludington and Milwaukee, will come out next December.

The Hill Ore Holdings on the Mesabi Range.

Reports have been published, particularly in the past two months, of the acquisition of the Hill ore properties on the Mesabi range by the United States Steel Corporation. The negotiations to that end have been a matter of general knowledge, but it is understood that the transaction has not been consummated. It seems to be taken for granted, however, that these properties, on some terms, will pass under the control of the steel corporation at an early date. This does not necessarily involve their purchase outright, nor does it involve the payment of money at the present time. The terms talked of have been rather widely discussed, and some of the current reports in this connection appear to be quite close to the facts. It is well understood, for example, that Mr. Hill is to receive for his ore what amounts to $1.80 a ton at Superior docks, which would mean $1 a ton for the ore in the ground—the valuation the steel corporation puts on its own ore, as appears from President Schwab's affidavit in the recent bond issue litigation.

The prime feature of any deal Mr. Hill makes will be tonnage for his Eastern Minnesota road, which in 1902 hauled to the Superior docks 4,180,568 tons. It is understood that in acquiring control of the Hill ore properties the steel corporation will not pay any bonuses, nor will it necessarily mine ore every year the contract is in operation. Mr. Hill requires a certain stipulated ore tonnage for the Eastern Minnesota road; if mines other than those in the proposed deal furnish that amount, the steel corporation will not be required to furnish any; but it must furnish whatever is lacking of the stipulated amount. This minimum tonnage for the Eastern Minnesota is raised year by year under the proposed contract, until it ultimately reaches 10,000,000 tons. And even then the steel corporation need not mine Hill ore, if from other sources 10,000,000 tons should be shipped over the Eastern Minnesota. The importance of the acquisition of the Hill properties by the steel corporation may be inferred from the details given below:

The J. J. Hill interests on the Mesabi range have been in process of accumulation for the past five years, during which time a consistent policy has been pursued, until these properties have reached an extent second only to the holdings of the United States Steel Corporation, and are sometimes estimated as high as 400 to 500 million tons. These holdings are pretty well concentrated, and while many of them are leased to operating and independent steel making concerns, much of the land and many of the located ore bodies are still in Mr. Hill's hand for such disposition as may be desired. Up to a few months ago Mr. Hill and his companies were actively negotiating for lands east of the central and western part of the Mesabi range, going so far as to carry on negotiations for Vermillion range lands, but at that time a division of territory was agreed upon between Hill and the largest other interest in this district, and he withdrew and has since confined himself to that part of the Mesabi west of T 58 R 18.

The bulk of the Hill holdings were secured by the purchase, four years ago, of the Wright & Davis lands and the Duluth, Mississippi River & Northern railroad, a line built by Wright & Davis for carrying out a logging contract. This road reached from Hibbing to the Mississippi river and connected with the lake over the Duluth & Winnipeg road, which had an ore dock at Superior. The Wright & Davis lands, bought for their pine timber, were stretched across T 57 R 21, along the ore bearing formation, and included both the Mahoning and Stevenson mines. At the time of the sale to Hill the Mahoning was in operation and the Stevenson had been discovered, though but comparatively little other ore was absolutely known to exist on the lands. The price paid for these mines and the railroad, as well as the enormous and very profitable logging contract held by the road, was a trifle under $4,000,000. It now seems a mere bagatelle; but at that time money was very tight and the present conditions were unexpected.

Mr. Hill did not acquire additional lands for some time. He bought the Duluth & Winnipeg road, paying par for the $1,000,000 of stock issued, which stock represented actual cash that had gone into the construction of the road, and taking up the less than $1,000,000 of the underlying bonds that had been issued by the road to pay for lands supposed to contain ore but which were north of the ore-bearing formation. Some ore lands were gradually secured until the formation of the United States Steel Corporation, with its control of the two remaining roads reaching the Mesabi range. Mr. Hill at once saw that to make his road profitable he must have ore of his own sufficient to maintain his road at a high pitch of traffic, as the corporation's roads would haul its ore and as much more as it could get, and he expected the corporation to continue the acquirement of undeveloped ore lands. This, however, it did not do immediately. The field was for a time left to him and he improved the situation. With abundant funds obtainable at the lowest rates the Eastern Minnesota road, which was the title of the Hill line, began buying leases and fee tracts by the wholesale, but very quietly. The stocks of many companies owning lands upon the ore-bearing formation were secured at low prices, State leases were bought at advances over the royalties demanded, and many tracts were taken outright. In the meantime a very considerable exploring business was carried on and tracts were examined with the drill all along the range as far east as the Mountain Iron mine in the center of T 58 R 18. All the lands belonging to the Midway Co. and located on the rangs in towns 58 and 59 R 18, were bought outright, though they were not known to contain ore of value.

The Hill companies now control a strip of land six miles long on the strike and more or less continuous across the width of the ore-bearing formation in T 57 R 21. In this are the Mahoning, Stevenson, Leetonia, Burrows and several other ore bodies of importance and a large area of unexplored land of possible high value. By the advance of cash for the purchase of other lands it also controls the traffic on several additional ore bodies in the same township.

It has been a favorite method of Mr. Hill to assist intending buyers of ore mines to a part of the cash required, in return for a contract for the traffic at going rate; and this has tied up to him a large amount of ore outside of his own ownership. Another method that has had the same result has been to permit the exploration of lands of his own under the royalty basis, in return for the traffic that the intending explorers might hold in their own ownership. This has brought to him large contracts for freight.

Hill holdings west of T 57 R 21 include large fee tracts, State and private leases of more or less value. The value of the range as one passes westerly is problematic, and much of the formation there is probably worthless for ore.

To the east of T 57 R 21 there is considerable tonnage north and east of Hibbing in T 58 R 20 under his control. This includes the Webb, Laura and Winnifred (the last two, which are Louis Hill properties, being recently leased to Corrigan, McKinney & Co.), the Pearce and Morrow, the Clark and Chisholm, some Alworth lands, the Jordan and Croxton, and a few other small tracts, the last of which are still held untaken by mining companies.

In T 58 R 19 the Wabigon and Wacouta iron companies, which hold large tracts, one of fee the other of State leases, are owned by this same interest. It has the traffic of the Grant, the Sharon, the Kinney, the Maitland, and other properties, and holds a large acreage of lands.

In T 58 R 18 all the Midway lands in the northwest part of the township are Hill-owned now, together with numerous other tracts, some of which are known to contain ore. It also has lands on the formation in the south part of the township north of this.

Mr. Hill owns no mines and controls no traffic east of the northwest corner of T 58 R 17, where are the Commodore and Sauntry mines, shipping over his line, and several

tracts of lands on which ore is known to be but which have not been leased to operators.

In addition to these holdings Mr. Hill is practically master of the old State grant lands of the St. Paul & Duluth road, which went into the possession of the Northern Pacific when that road bought the other two years ago. These lands are controlled by the Northern Security Co., and in that way are under Mr. Hill's dictation. These are probably of less value than the properties mentioned before.

New Coke Ovens in the Uniontown, Pa., District.

The erection of new coke ovens in the vicinity of Uniontown, Pa., is being greatly delayed owing to the scarcity of coke oven brick and other material that enter into their construction. Many plants that were to have been in operation on July 1 cannot possibly be completed before late in the year and it is probable that many of them will not produce coke until 1904. In addition the contractors in the region who sink shafts for the opening up of coal beds have more work on their hands than ever before and the opening up of mines is being greatly delayed. The new coke operations include the following: Oliver & Snyder Steel Co., 800 ovens; Wheeling Steel & Iron Co., 400 ovens; Brier Hill Coke Co., 400 ovens; W. P. Murray, 200 ovens; Orient Coal & Coke Co., 400 ovens, and the Central Coal & Coke Co., 150 ovens. Two shafts for opening up the property of the Brier Hill Coke Co. are now being sunk and the work of erecting the ovens will be proceeded with at once. The Orient Coal & Coke Co. is proceeding with only 100 ovens at the present time, but will erect the additional 300 ovens in the near future. The Hecla Coke Co. has just completed 100 ovens in the Connellsville region and 50 have already been fired. Never in the history of the coke industry have the profits been as large as at the present time. Foundry coke is finding ready sale at $6.50 to $7 at the ovens, while furnace coke is selling at $5.50 to $6. It is told of one plant in the region which originally cost $40,000 about a year ago, that $100,000 was offered the owners for their property. They refused to sell, stating that the profits from their operations were $8,000 per month.

Mohawk Valley Steel & Wire Co.

Telegraphed reports concerning the plans of the Mohawk Valley Steel & Wire Co. for an extensive steel plant at Brunswick, Ga., leave much to be desired in definiteness. The company was chartered under Maine laws in December, as noted in these columns, and has an authorized capital of $25,000,000, with a projected bond issue of $10,000,000. Frank A. Umstead, formerly of the Hartman Mfg. Co., is the promoter. Under his contract with the citizens of Brunswick his company is to be given 1,000 acres of land, a stock subscription of $300,000 by residents of Brunswick and certain exemptions from taxation. The company engages to build blast furnaces, steel plant and rolling mills to cost $6,000,000 and a shipbuilding plant to cost $1,000,000. The location of Brunswick is favorable from the standpoint of exports, but there are no advantages in raw material supply, nor in the assembly of materials. The latter would in all probability be hauled from Alabama. The Garrett-Cromwell Engineering Co. has the contract to design and erect the entire plant in case the project is carried through.

There is no foundation for the newspaper reports concerning a consolidation of the Mohawk Valley Steel & Wire Co., the Alabama Consolidated Coal & Iron Co., the Brunswick & Birmingham Railroad Co., and the Brunswick Dock & City Improvement Co.

Western roads, through a bureau of information just established by the general managers of the twenty-eight roads entering Chicago, announce that the outlay of millions of dollars for improvements has been abandoned for the present by Western roads because of the high cost of labor and materials. The Milwaukee & St. Paul has ordered the abandonment of the work of double-tracking its main line from Milwaukee to La Crosse. For similar reasons the Chicago & Alton has abandoned, for the present, improvements and betterments contemplating an expenditure of $2,000,000. These reports, it is asserted, are given out to allay the bitter feeling caused among Western shippers, merchants and manufacturers over the advances lately made by Western and Eastern roads in rates on various kinds of merchandise and commodities.

Advances in Freight Rates on Coal.

(Special Telegram.)

PITTSBURG, Feb. 18.—At a meeting of the Western Pennsylvania and Eastern Ohio Traffic Association held in this city yesterday action was taken on coal freight rates for the year dating from April 1. The rate from Pittsburg to Chicago was raised 10 percent, the basing rate being $1.90. From Ohio points to Chicago the advance was from $1.50 to $1.65, and from West Virginia to Chicago from $1.90 to $2.05. The lake rates from the Pittsburg district were put up from 73 to 80 cents, those from the Ohio district from 75 to 85 cents and those from the West Virginia district from 81¾ to 91¾ cents. The commercial rates from mines in all districts were increased from 90 cents to $1. The latter rates apply only to coal that is not shipped over the lakes. Short haul rates were advanced from 60 to 70 cents.

Clairton Ore & Coal Co.

(Special Telegram.)

PITTSBURG, Feb. 18.—The Clairton Ore & Coal Co., which will be a subsidiary company of the Crucible Steel Co. of America, will be incorporated under the laws of the State of Pennsylvania on March 11. The new corporation will own and control the company's ore, coal and coking properties. These include 2,500 acres of coal land in Fayette Co., Pa., on which a large number of coke ovens will be built. The holdings of ore lands are also very extensive.

Pickands, Mather & Co., of Cleveland, have issued a pamphlet containing exhaustive analyses of all iron ores shipped by them in the season of 1902.

The J. D. Smith Foundry Supply Co., of Cleveland, manufacturer of foundry facings and supplies, has issued a daily reminder vest pocket size, which adds to the daily memorandum spaces a number of pages of valuable data for business men.

It is reported at Pueblo, Col., that the Colorado Fuel & Iron Co. recently had a force of surveyors looking over the land at Salt Creek, about two miles south of its present plant at Minnequa, and that the result will be the erection there of several blast furnaces. The management is quoted to the effect that furnaces may be built there within a few years.

The promoters of the proposed consolidation of manufacturers of drills and other agricultural implements to be called the American Seeding Co. announce that the formal transfer of properties is likely to be completed by March 1. President Bookwalter of the Superior Drill Co., of Springfield, O., is mentioned for the presidency of the new company.

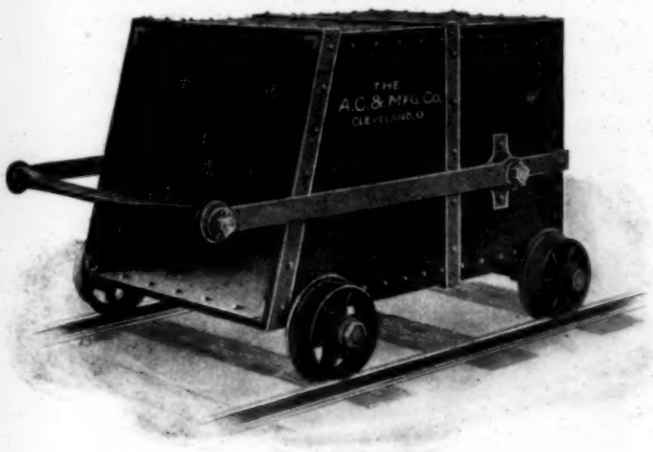
The last of the resolutions to be incorporated in the convention program of the Amalgamated Association of Iron, Steel and Tin Workers were received by Secretary Williams at headquarters at Pittsburg, on Tuesday, Feb. 17. Some of the lodges have sent in resolutions asking for slight advances, but it is probable that few, if any, changes in the wages scales will be made at the convention to be held in Columbus, O.

The Buffalo Foundry Co., Buffalo, N. Y., began operations on Feb. 3, at its new plant, which gives about five times the capacity of the old one. Numerous orders have been booked recently for both large and small castings.

A STEEL MINING SKIP.

The accompanying illustration shows a steel mining skip car built by the Atlas Car & Mfg. Co., Cleveland. These cars are employed extensively in the ore producing sections of this country, especially at the iron ore mines of the Lake Superior regions. The plates composing the body are reinforced and joined at the corners by heavy steel angles closely riveted. Steel bands are also riveted along the edges of the plates at the open end and around the middle of the car, thoroughly reinforcing these points.

In some instances false bottoms are furnished upon these cars, the makers advising this as it serves as a protection to the bottom plates which would soon wear through from the constant clearing of the hard ore. This false plate can be readily replaced when required. The axles are square steel secured to the bottom plate by strap forgings. The wheels used are a distinctive feature, consisting of manganese steel with brass bushings. These wheels are the self oiling type, being provided with a



A STEEL MINING SKIP.

receptacle or chamber for retaining oil which keeps the bearings well lubricated. The draw bar and bail are heavy forgings with trunions riveted to the side plates instead of placing them at the rear end of the car, which is a more common construction. The dumping operation is automatic being accomplished by the use of wheels with extra wide face upon the rear axle.

The car is intended to be dumped from an inclined trestle and is elevated by cable power. At the point arranged for dumping the point wheels pass through an opening upon a horizontal track, while the rear wheels are engaged by two rails of considerably wider gauges, causing them to continue to ascend the incline. By this months to rest and will then consider future business the contents.

A $15,000,000 Bond Issue of Lackawanna.

Announcement has been made in the past week that the Lackawanna Steel Co. will issue and sell to a syndicate headed by Speyer & Co., and Kean, VanCortlandt & Co., of New York, a new issue of $15,000,000 5 percent convertible trust mortgage bonds. No statement is made concerning the specific purposes to which the proceeds of this issue are to be applied, but they are presumably for extensions of the original plans of the new plant at Buffalo and for the acquisition of additional iron ore properties. John J. Albright, of Buffalo, a director of the company, who acquired the land on which the new plant is being built, confirms the announcement concerning the bond issue and says that the company now holds iron ore properties that will produce all the ore needed for many years to come, and that it will be unnecessary to buy any ore from mines other than those which the company has developed or will develop. The original Lackawanna Iron & Steel Co. had an authorized capital of $20,000,000 and was bonded for $1,800,000. The new Lackawanna Steel Co. has an authorized capital of $40,000,000 of which $35,000,000 has been issued. Until the present issue of $15,000,000 convertible bonds the only funded debt was the $1,800,000 issue.

PERSONAL.

E. H. Mumford, of the Tabor Mfg. Co., Philadelphia, has gone on a business trip to England.

R. J. Gross, second vice president of the American Locomotive Co., will sail from San Francisco in a few days for a trip around the world. He will visit Honolulu, Japan, Korea, Siam, China, Russia, and every country of Europe. The purpose of his trip is to make a careful investigation of the opportunities for business expansion in the Orient and European countries and to establish business relations in the foreign countries he proposes to visit. Mr. Gross will be accompanied on his trip by Charles M. Muchnic, until recently mechanical engineer of the Denver & Rio Grande Railroad.

John Stevenson, Jr., vice president of the Sharon Steel Co., will resign his position March 1, though tendered the management of the Sharon plant. He will go to Scotland for an extended visit.

Colonel Isaac L. Ellwood, for years associated in business with John W. Gates, will retire on Feb. 28 from his special partnership in Harris, Gates & Co.

Ex-Lieut. Gov. Timothy L. Woodruff has accepted the presidency of the Smith Premier Typewriter Co., Syracuse, N. Y. He succeeds Lyman C. Smith, who recently resigned.

John A. Topping, first vice president of the American Sheet Steel Co., will sever his connection with the company on March 1. He was one of the organizers of the company and prior to its formation was the National Steel Co.'s manager in charge of the Aetna-Standard works, including the furnaces and steel works at Mingo Junction and the finishing mills at Bridgeport, O. Mr. Topping has been connected with iron and steel manufacture from the beginning of his business life, being for a number of years secretary of the Aetna-Standard Iron & Steel Co. and later its president. He purposes now to devote several months to rest and will then consider future business plans.

It is reported that John Reis, manager of the New Castle works of the National Steel Co., will have the management of the Sharon works of the Union Steel Co.

James A. Green, of Matthew Addy & Co., Cincinnati, has returned from a trip to Cuba.

Charles Day, of the firm of Dodge & Day, engineers, of Philadelphia, read a paper at the last meeting of the Westinghouse Electric Club, of Pittsburg, on "Recent Developments in Machine Tool Equipment."

C. C. Bolton, of M. A. Hanna & Co., Cleveland, who is spending a portion of the winter in California, will return in March.

I. M. Scott, auditor, and Harry Cook, manager of the Wheeling district, American Sheet Steel Co., have tendered their resignations.

The Avery Stamping Co., of Cleveland, has a patent on a plain back style of shovels in which there is but one weld. A steel plate is welded to the back of the blade of the shovel, carried up underneath the shank portion and there encased, no wood showing. This plate may wear through but, as the shank is still perfect, the shovel remains serviceable. Another feature grows out of the law of the lever. The bend of the handle begins in the body of the shovel blade instead of outside, or, in other words, above the shoulders of latter. This gives an advantage of four inches in leverage, the hand of the operator being brought so much closer to the load, requiring less exertion and resulting in more work. Each individual blank or sheet of steel is rolled singly, both sides coming in contact with the rolls.

The Standard Plunger Elevator Co.'s plant at Jamesville, Mass., will be in operation in about a month. Machinery is being installed.

CINCINNATI MACHINERY MARKET.

Aside from troubles arising from the congested condition of the railroads and the delays incident to both inbound and outbound shipments, the machinery trade is moving along in most satisfactory condition. The first half of February has brought in enough new orders to give promise of a continuance of the activity now so long enjoyed by the machinery and machine tool builders. Prices are well maintained and the shops are working up to capacity in order to make satisfactory deliveries, but in some cases it is difficult to keep up with the demand. A few straggling foreign orders are coming in, but the great bulk of the business is domestic. Shops generally have a full complement of men and are turning out a large output. The regularity with which the shops are working puts the manufacturer in good position to fulfill promises to customers, but railroad difficulties make deliveries uncertain. The outlook for the future is regarded with every indication of a continuance of good business.

The Lodge & Shipley Machine Tool Co. reports a good demand for lathes and a good run of orders so far this month. It has sold all its old type lathes and sells the new type now exclusively. The new type lathes are all single pulley driven with variator countershaft. This doubles the power, saves the belts and shortens the time of handling. Motor-driven machines are being much called for and growing in popularity. This company is giving much attention also to its new rapid reduction lathe, which has a large range of speeds and feeds.

The Cincinnati Shaper Co. is getting a nice run of orders right along. The company reports nothing in any way discouraging in the outlook.

The John Steptoe Shaper Co. reports business good and February business keeps right up with the nice January run of orders. The company is running full time and with full force and making a regular and satisfactory output. The two officials, vice president and general manager, contemplated at the time of organization, have not yet been elected.

The Rahn-Mayer-Carpenter Co. is busy and is contemplating some increase in facilities. One order last week was for four lathes for Belgium, but business is mostly domestic.

The Cincinnati Planer Co. has spent considerable money in improvements the past year and expects to be able to employ all its facilities right along. Orders are heavy and the company is making a satisfactory outturn of work. The trade is all domestic now. The outlook for the year is excellent.

The Dreses Machine Tool Co. reports new business coming along satisfactorily and its shop is running full. A little foreign business is coming in now and then, but trade is mostly domestic.

The business year of the Cincinnati Machine Tool Co. closed the first of February and made a nice showing. Business was heavier than in the preceding year and the outlook for the coming year is very bright.

Schumacher & Boye made application on Feb. 10 for a building permit for the erection of a new $10,000 building on Spring Grove Ave., between Harrison and Queen City Aves. It will be 80 feet front by 144 feet deep to Buck Street.

The American Laundry Machinery Co., of this city, has obtained a substantial contract from Germany.

The Stewart Iron Works will remove their business to Covington, Ky. Ground was broken on Feb. 11 for the erection of their new plant at Seventeenth St. and Madison Ave., Covington, which will be erected and equipped at a cost of about $25,000. The site adjoins the tracks of the C. & O. R. R. and the old K. C. Ry., and there will be two switches connecting with the building. The plant will be equipped with the latest machinery which will be run entirely by electricity. There will be a building for the architectural work, one for the jail work, one for the structural work, and one for the fence department. As soon as the building is completed the plant in Cincinnati will be abandoned and all business will be done in Covington.

At a meeting of the directors of the American Tool Works Co. last week the retirement of Robert Laidlaw and Thomas P. Eagan from the board was announced. They have been succeeded by H. H. Peck and R. J. Smith. This change results from the recent sale of stock by which Franklin Alter obtained a controlling interest. It is understood that extensive additions are to be made to the plant. Louis E. Voorheis, vice president and general manager, has resigned and is succeeded by J. B. Doan, formerly general sales manager, and a man thoroughly familiar with the machine tool business.

The Vermillion Iron Range.

In Monograph XLV. of the United States Geological Survey, now in press J. Morgan Clements gives an elaborate account of the Vermillion Iron-Bearing District of Minnesota, his endeavor being to make his report a complete epitome of existing knowledge of the Vermillion District. In his letter of transmittal Prof. Van Hise, under whose direction the work is carried on, notes that the monograph is the fifth one of the series of six which treat of the iron-bearing districts of the Lake Superior region. The monographs on the Penokee, Marquette, Crystal Falls, and Mesabi districts have already been published. The last of the series is to be a monograph on the Menominee district, by W. S. Bayley. There has also appeared a monograph on copper-bearing rocks, by R. D. Irving. It is planned to close the work of the United States Geological Survey in the Lake Superior country by a final monograph on the Lake Superior region as a whole.

This Vermillion monograph contains the first series of detailed maps of that district, a district in which the rocks the Archean age contain economic deposits. The area mapped in detail is about 1,000 square miles. The territory included in the district lies in the extreme northeastern portion of Minnesota, including portions of St. Louis, Lake, and Cook counties. It is a narrow belt, trending east-northeast, which ranges from two to eighteen miles in width, and has a length of somewhat over 80 miles, extending from the west end of Vermillion Lake to Gunflint Lake, on the international boundary.

The iron ore deposits of the Vermillion district show a striking analogy to those of the Marquette district, being found at the bottom of the iron-bearing formation and also within it, the ores in both cases being the same in character. The ores are extremely hard, massive, blue hematites. The original source of the iron ores was the Ely greenstone. Workable ore deposits are known at two localities—Soudan and Ely. The methods of mining in the Vermillion district are briefly described.

Iron ore was first observed in the Vermillion district in 1850. During the sixties there was a small rush to the district in consequence of the reported occurrence of gold near Vermillion Lake, but no gold deposits of any importance were found. In 1875 the first exploratory work in this district was begun, resulting a few years later in the purchase by the Minnesota Iron Co. of large tracts of land, including over 20,000 acres on the Vermillion range proper. In 1884 the Duluth and Iron Range Railroad was completed from Two Harbors to Tower, and shipments of 62,122 tons of ore were made that year. According to the report of the Minnesota Iron Co. the shipments from the Vermillion district from 1884 to 1901, inclusive, amounted to 17,038,124 long tons. The report is illustrated by 13 plates, 23 figures and 26 atlas sheets.

The Dodge Coal Storage Co., of Philadelphia, is building a large coal handling crane to be installed at the Maryland Steel Co.'s plant at Sparrow's Point. This crane will be driven by electric motors, and the Dodge company has recently purchased for this purpose one 50-horsepower and two 30-horsepower, direct current motors with controllers, from the Westinghouse Electric & Mfg. Co.

A LARGE BLOOMING MILL GEAR.

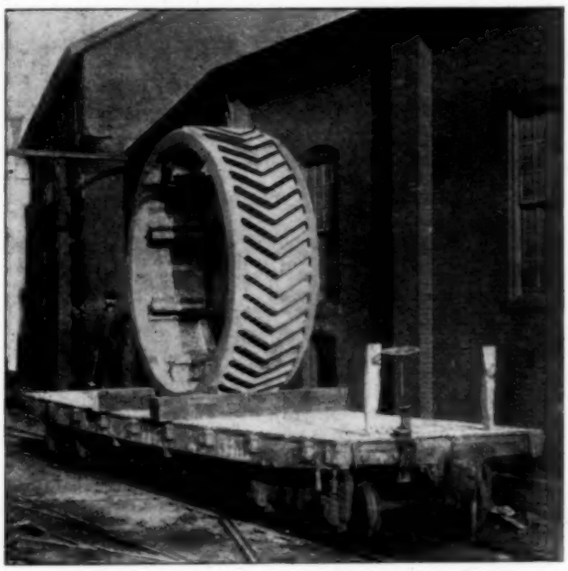
A large gear recently cast at the steel foundry of the Otis Steel Co., Cleveland, is illustrated below. It goes to the new blooming mill of the Lackawanna Steel Co. at Stony Point, south of Buffalo, and is one of the largest built for such use. Its diameter is 13 feet 2.4 inches, with 4-foot face and the teeth, which being of the helical pattern involve more difficulty in molding than plain gears, are of 10-inch pitch. The weight of the gear is 55,530 pounds.

The light lugs cast on the inner circumference of the wheel present something of a departure. They will be fitted with springs to furnish an elastic connection between the rim and the arms of the pulley, taking up the jar from reversing.

More Coke Ovens in West Virginia.

Among the companies recently incorporated which will develop coal mines and build coke ovens are the following in West Virginia:

The National Coal & Coke Co., Belva, capital $25,000, owning 425 acres of coal land, has been organized to open mines and build ovens. Charles Jasper has been chosen as general manager at Belva, and developments will begin at once. Mt. Carmel, Pa., parties compose the company.



LARGE GEAR FOR BLOOMING MILL.

The Waddell Coal & Coke Co., Huntington, capital $1,500,000. S. H. Waddell, of Pittsburg, Pa., will be president, and Theophilus Sproull, also of Pittsburg, treasurer. The company will soon begin opening mines and building coke ovens.

The Wabash Coal & Coke Co., of Clarksburg, W. Va., has organized to develop 2,000 acres of coal lands in Marion county and to build coke ovens. President, J. T. McGraw, of Grafton, W. Va.; vice president, S. F. Reed; treasurer, Hugh Jarvis, both of Clarksburg.

The Clinton Coke Co., Morgantown, has been incorporated to mine coal and manufacture coke. Capital stock $1,000,000. Incorporators, J. J. Rankin, of Pittsburg, Pa.; C. N. Brady, J. E. Miller, A. P. Duncan, and H. B. Duncan, of Washington, Pa.

The Baldwin Locomotive Works, of Philadelphia, has recently completed five mogul locomotives for the Hokkaido Government Railway of Japan, two consolidation engines for the Hokkaido Coal Mining & Railway Company, and one 18-wheel engine for the Sanyo Railroad, Japan. A narrow gauge mogul locomotive has been ordered for Honolulu and Cuba.

Electric Power for Machine Tools in Locomotive Shops.

The tests referred to below were made at the locomotive shops of the Buffalo, Rochester & Pittsburg Railway at Dubois, Pa., with the purpose of ascertaining the amount of power used by various machine tools when operating in regular, routine work, and at the same time the power lost in shafting and belting in a grip-driven system. If all the machines in a group were thrown on and driven at their highest capacity at one time, they would in most cases probably require an amount of power approximating the capacity of the motors as they are installed in this plant. However, in the conditions of actual, daily operation, this never happens. Some of the tools are always either standing idle or working lightly, and the amount of power demanded hardly ever reaches half of the possible maximum total. The load factor is the ratio of the average power to the maximum.

The plant at Dubois consists of five buildings—the power house, a building containing the locomotive erecting, boiler and machine shops, the round house, the blacksmith house, and the store-house and offices. These buildings are located on a plat of ground 32 acres in extent and the equipment is intended to handle the repairs of about 150 locomotives, with provision for an increase of 75 engines which is expected to cover about five years, making an estimated ultimate total of 17 engines a month. The machine, boiler and tank shops are under one roof, covering an area of 134x524 feet. The blacksmith shop is 80x140 feet, the power house 63x103 feet, the office and store-house 60x120 feet; and in addition to these, there is an oil house 30x60 feet, a 16-stall round house, and a 26x140 foot coal, coke and iron storage building. The store-house contains general store-room facilities on the first floor, and offices, draughting room, etc., on the second floor.

The power plant is designed for the transmission of power by electricity and compressed air, and furnishes all power needed for driving the machinery, lighting the shops, grounds, a large car-building plant, and neighboring stations, and the further supply of steam for heating the buildings. All pipes and wires pass from the power house to the several buildings through underground galleries. The boiler equipment comprises four 200-h. p. water tube boilers, the furnaces of which are hand fired. The engine room contains the following machinery:

A Westinghouse 200-h. p., compound engine, direct connected to a Westinghouse, 125-k. w., d. c., e. t., compound-wound generator, operating at 250 volts and 280 r. p. m. This carries the day load and supplies power for machine tools, cranes, lighting, etc.

A Westinghouse, 100-h. p., simple engine, belt connected to a Westinghouse, 75-k. w., d. c., compound-wound generator, operating at 250 volts and 750 r. p. m. This generator carries the night load and supplies power for lighting, motor driving for special night work and the turntable. The night and day load generators are interchangeable at the switchboard.

A Westinghouse, 100-h. p., simple engine, belt connected to a Westinghouse, 60-k. w., two-phase, a. c. generator, operating at 2,200 volts, 7,200 alternations and 900 r. p. m. This generator furnishes power for lighting the yards, the Falls Creek station, the passenger and freight stations at DuBois and the DuBois car shops.

A Westinghouse, 2½-h. p. exciter, operating at 125 volts and 180 r. p. m.

A standard marble switchboard.

An Ingersoll-Sergeant, steam-driven compressor, furnishing compressed air for the plant.

The results of the tests are given below, at length with all particulars, the net power consumed by each tool or group of tools being stated. It is to be noted that the net power consumed by the several tools and by the line shafting was not obtained directly, but by subtraction. All measurements were made by means of a volt-meter and an ammeter in the motor circuit. These indicated the lectrical horsepower delivered to the motor. The brake horsepower delivered by the motor at any given load was then determined by means of the motor efficiency curve. This is a source of considerable error at low

readings, since the actual efficiency of the motor as installed may differ from that given on the curve sheet. The amount of power consumed by the shafts and belts being known and then the amount consumed with the tool running being taken, the first quantity was subtracted from the latter to give the amount actually consumed by the tool. This probably gave very nearly the correct results, since the energy lost in shafting and belting is very nearly constant at various loads. The tests were made while the shops were in full daily operation, and it was for that reason impossible in many cases to make as direct measurements as might seem desirable. In order to present the actual conditions of each test the log has been given below in full as recorded, except that all readings are translated into brake horsepower delivered at the tool. In explanation of the small loads allotted to some of the motors, it should be stated that when they were selected provision was made for the probable increase in the capacity of the shop. Experiments are, also, being conducted with high-speed cutting steels, which, if adopted, will considerabl increase the demands for power.

These tests, in addition to furnishing accurate data relating to the power required for various tools when starting, running light and cutting, also make possible some estimation of the merits of roller bearings for shaft hangers. The line shafts are cold rolled steel and are carried on Hyatt roller bearings and a shaft 200 feet long without belts could be turned by hand. But in spite of the unusual efficiency of the bearings, it will be noted that the power consumed by the tool is often less than that lost in transmission. Nevertheless, the capacity in motors required for the group drive is two to two-and-a-half times smaller than it would have been had each tool been provided with an individual motor. It is a question as to how far the low average power taken by large groups of tools in operation may be due to the fly-wheel action of the shafts and pulleys.

The locomotive-erecting, boiler and machine shop consists of a middle aisle for erecting and two shed bays equipped with shafting for driving the machine tools. Two 50-ton, electric traveling cranes have a runway in the middle aisle. There are five lines of shafting driven by five shunt motors in the shed bays and the sections are designated as wheel section and boiler section in one bay, and lathe, tool and flue sections in the opposite bays.

Wheel Sections. Shafting driven by a 40-h. p., shunt-wound motor and operating: 42-inch car wheel boring mill, 48-inch car wheel lathe, two 79-inch wheel lathes, quartering machine, 60x60x18-inch planer, 84-inch boring mill, single axle lathe, 6-foot radial drill, 18-inch slotter, band saw, No. 7 grinder, water tool grinder. The line shaft is 200 feet long, 2½ inches in diameter, and has 26 hangers. It was inconvenient in this instance to obtain a test of the line shaft alone. A test of the line shaft and counters only gave 1.5-h. p.

A 15-minute test was made of a group of machines comprising a 72-inch and a 66-inch wheel lathe each with two cuts, a wheel press operated at 50 tons, and an 84-inch Niles boring mill, a band saw belt, an emery wheel, a Pond radial drill, and a 60-inch planer, with one tool cutting cast iron, with an average result of 4.6 h. p., a minimum of .88 h. p. and a maximum of 10.43 h. p. The speed of the line shaft was 160 r. p. m. Two machines were then thrown in, a 42-inch wheel lathe cutting with one tool and an 84-inch boring mill, with the wheel lathe cutting, the boring mill on starting up took 6.9 h. p., and cutting 3 h. p.

To the above two machines were added, a tool grinder and a 79-inch wheel lathe cutting, which starting up took 6.3 h. p., and running steadily 3.95 h. p. There was then added a 60-inch planer, cutting a cast iron cylinder, which at starting took 10.3 h. p., and running steadily 4.2 to 7 h. p., or an average of 6.1 h. p. during the whole time. To the above were added another tool grinder and an 18-inch slotter. The maximum reversals of the planer and the slotter at the same instant gave 15.5 h. p., and steady running showed 5.2 h. p. The planer interfered somewhat with the readings. To the above was added a band saw cutting 4-inch oak, which took 5.6 h. p. Whether the saw was cutting or not seemed to make no difference in the reading.

Tests of single machines were then made; that is, of the power consumed by the one machine tool thrown in at a time. A 42-inch wheel lathe with one tool cutting took on starting up 4.6 h. p., and on steady running .5 h. p. An emery wheel took .7 h. p. A 79-inch wheel lathe with two tools making roughing cuts on a pair of drivers took 4 h. p. An 84-inch boring mill boring an 8-inch cylinder took 2 h. p. A 60-inch planer cutting a cast iron cylinder took 2 h. p., and a maximum at reversal of 8.5 h. p. An 18-inch slotter with tools of ¾-inch face cutting steel took .3 h. p., and a maximum at reversal of 1.2 h. p. A band saw starting up took 6.3 h. p. and running light or cutting 4-inch oak 4 h. p. A group run of 84-inch boring mill, a 79-inch wheel lathe, a 6-foot radial drill, a 60-inch planer, and an 18-inch slotter gave at steady running 6.9 h. p., and with the planer at reversal took 14 h. p.

circuit. These indicated the electrical horsepower delivered to motor and operating: 12-foot bending rolls, bolt cutter, stay bolt cutter, drill press, tool grinder, Brooks plate planer, horizontal punch, shear and punch, 6-foot bending rolls, 6-foot straightening rolls, 6-foot radial drill.

All the counter-belts were thrown off and the line shaft tested alone, with a result of .3 h. p. This line shaft is 170 feet long, 2½-inch in diameter and has 19 hangers. The speed of the line shaft was 158 r. p. m. A test of the line shaft and countershafts, only, gave an average of 2 h. p.

The machines comprising the first group tested were: A stay-bolt cutter and a bolt cutter, a No. 4 Hilles & Jones punch and shear. The No. 4 punch and shear was punching 13-32-inch holes in 3-16-inch steel plate. A 15-minute test showed an average of 1 h. p., with a minimum of 2 h. p. and a maximum of 3.5 h. p. A single tool, the No. 4 Hilles & Jones 48-inch punch and shear was then thrown in, and starting up light took 6.9 h. p., settling down to .4 h. p. Shearing 5-16-inch steel plate, it required 3 h. p. A 6-foot radial drill was then added, and at starting up light took 3-6 h. p., settling down to 1.1 h. p. A 1½-inch drill cutting in steel gave 1.5 h. p. A 6-foot radial drill and bolt cutter required 1.1 h. p. The 12-foot rolls were then added, and starting up light showed 7.3 h. p., settling down to 4.75 h. p. Rolling steel plates, ½x8-inch required 5.3 h. p. A test of line shaft and counters with the 6-foot radial drill cutting steel with 1½-inch drill, and a punch and shear running light showed 2 h. p. A 1-inch stay-bolt cutter added to the above took on starting up 4.5 h. p., and cutting 12 threads per inch gave 2.1 h. p.

Lathe Section.—Shafting driven by a 30-h. p., shunt-wound motor and operating: 24-inch crank planer, 36-inchx36-inchx20-foot planer, 51-inch boring mill, 16-inch shaping machine, 24-inch lathe, 24-inch drill press, 37-inch boring mill, two 22-inch lathes, three 16-inch lathes, two 18-inch lathes, 28-inch lathe, 43-inch lathe, 2-inchx24-inch flat turret lathe, two 26-inchx26-inchx10-foot planers, 60-inch horizontal boring machine, water tool grinder, centering machine.

The line shaft and counters gave 4.1 h. p. A test of the line shaft with counterbelts off gave .7 h. p. The speed of the line shaft was 155 r. p. m. The line shaft is 180 feet long, 2½ inches in diameter, and has 22 hangers. A 15-minute test was made of a group of machines comprising two 26-inch planers and one 36-inch planer, cutting steel with one tool each, a turret lathe, an emery wheel, three 16-inch lathes, two 22-inch lathes, a 36-inch boring mill, drill press, and a shaper, all in operation. The readings gave an average result of 6.9 h. p., a minimum of 4.74 h. p. and a maximum of 15 h. p.

A group run of a 26-inch planer, three 16-inch lathes, an 18-inch lathe, a 24-inch lathe, a 16-inch shaper, a 24-inch drill press, and a centering machine in operation required at steady running 2.4 h. p., and at reversal of the planer 7.6 h. p. A single 26-inch planer cutting cast iron took 1 h. p., and at reversal 3.5 h. p. A 16-inch shaper cutting 1-32-inch steel at 12-inch stroke took .9 h. p., with a minimum of .2 h. p. and a maximum of 1.4 h. p. A 24-inch turret lathe cutting required .3 h. p. A 24-inch lathe boring brass took .03 h. p.

Tool Section.—Shafting driven by a 20-h. p., shunt-wound motor and operating: Tool grinder, drill grinder, 21-inch drill press, 16-inch lathe, milling machine, grinding machine, three 18-inch turret lathes, 24-inch drill press, 28-inch lathe, No. 10 vertical milling machine, 2-spindle rod drills, 14-inch pillar shaper, 16-inch lathe, 26-inchx26-inchx6-foot planer,

32-inch drill press, surface grinding machine, water tool grinder.

The line shaft and counters required 2.8 h. p. The line shaft is 140 feet long, 2½ inches in diameter, and has 20 hangers. It was not convenient to obtain a test of the line shaft alone. The speed of the line shaft was 155 r. p. m. The line shafts of the lathe and tool sections can be connected by a clutch coupling and the whole operated from either motor. A group test was made of a 16-inch lathe, a drill press, and a grinder, all in operation, with a result of 1.9 h. p. A single grinder took in starting up 9.7 h. p., and griding 1.95 h. p. A 28-inch lathe took on starting 4.7 h. p. and cutting steel 2.5 h. p. A group run o ftwo 16-inch lathes, a shaper, and two grinders in operation showed 2.5 h. p.

Flue Section.—Shafting driven by 10-h. p. shunt-wound motor and operating: Flue welder, flue cleaner, two No. 7 Jarecki pipe threading machines, two pipe cutters. A test of the line shaft with all counters gave .6 h. p. A test of the line shaft gave .035 h. p. The line shaft is 90 feet long, 2½ inches in diameter, and has 12 hangers.

A single flue welder with blowing fan attached required on starting up 7.1 h. p. Running light it took 3.4 h. p. The pipe cutter cutting 2½-inch pipe took .06 h. p. The auto-flue cleaner, cleaning 2-inch flue, took .2 h. p.

Flue Rattler.—Outside at the end of the machine shop is a flue rattler operated by a 7½-h. p., shunt-wound motor.

Blacksmith Shop.—The blacksmith shop is driven by a 40-h. p., shunt-wound motor, which is belted to 75 feet of 2½-inch line shafting with 12 hangers. The apparatus driven comprises a bolt header, a 25-inch punch and shear, a cutting-off saw, a tool grinder, a 40-inch planer, a drill press, a 50-pound hammer, a blower, and an exhaust fan. A test of the line shaft and counters with grindstone and two blowers constantly in operation gave 14.5 h. p. The bolt header added to the above gave on starting 7.8 h. p., running light .5 h. p., and heading 1-inch bolts 3.5 h. p. A No. 2 Hilles & Jones punch and shear added to the above, first condition, gave on starting up 5.5 h. p., running light .5 h. p., and shearing 1½-inch round bar 4.3 h. p.

Turntable.—The turntable is 70 feet long and is operated by a 10-h p., D. C. motor of the street railway type geared to an independent traction wheel, the driving combination being supported in a pivoted frame, or "donkey," which rests with all its weight upon the turntable track, even when the table is tipped by a locomotive. The power is led to the motor through a sliding contact placed on the bridge above the center of the turntable. With the table running light and the controller on full, a test gave 4.45 h. p. In throwing on the controller and accelerating up to full speed 5 h. p. was attained, which dropped to a constant of 4.45 h. p. With a Class S-2 locomotive on the table, weighing with tender approximately 286,000 pounds, a test gave 7.35 h. p. when accelerating at full speed. When full speed was attained, the test showed 5.43 h. p.

Power House.—Switchboard readings of the ammeter and voltmeter were taken every five minutes from 1 p. m. to 5:30 p. m. with averages of 220 volts and 250.7 amperes, or 73.8 h. p. The minimum current was 200 amperes, or 59 h. p., and a maximum current 300 amperes, or 88.5 h. p., the average of which is 250 amperes, or 73.75 h. p. These tests were carried out by H. M. Palmer and George H. Gibson, of the Westinghouse Electric & Mfg. Co.

American Foundrymen's Association, Metallurgical Section.

The American Foundrymen's Association has recently organized a Metallurgical Section. This was undertaken in response to an increasing demand for an organization to harmonize methods of analysis or iron. It is designed to increase the use of chemistry and metallurgy in foundry and furnace work, and serve as a board of exchange for those interested in the study of iron as a specialty. All furnaces and foundry companies, individual chemists, and independent laboratories who would be interested in receiving more particulars concerning this section are requested to send their names to the secretary, Herbert E. Field, Box 104, Ansonia, Conn.

THE PAYNE CO. AND THE PREMIUM PLAN.

We have referred in previous issues to the trouble at the works of the Payne Co., Elmira, N. Y., beginning with a demand by the union machinists that the company withdraw a notice posted Dec. 26, 1902, substituting the individual premium plan for the blanket premium plan of rewarding employes for extra effort, in addition to regular day's pay. The company has made a further statement in a local paper from which, in view of the general interest of metal-working companies in this important question, we make the following extracts:

"It has been stated that we do not recognize unions, committees or delegates. Replying to that would say this company never refuses to see anybody who has business to transact with it, and we will give careful and courteous consideration to any business proposition presented in a lawful and business-like manner. We are not, however, to be intimidated by threats, coercion and unlawful force. In the employment of men we make no discrimination in favor of or against them on account of race, politics, religion or membership in any oath-bound secret organization; simply insisting upon a fair return for fair wages paid.

"After the posting of our notice referred to above, one-third of the employes officially declined to work under the shop rules, quit, were paid off, and have no further connection with the company. They had a perfect right to do so. It is equally right and proper that the company shall hire such other men as are desirous of serving the company at mutually satisfactory wages and conditions of employment.

"For a year and a half the 54 hour schedule has been in use, with time and a quarter paid for time in excess of 54 hours, which is the prevailing custom in this section of the state.

"We believe in any legitimate and economic means of increasing men's wages, but if it is not done with a correspondingly scientific reduction in cost of production, it is a step backward in the progress of civilization. The whole industrial world is constantly striving to reduce cost of production, the result of which benefits mankind. The day wage plan of paying labor when employed alone offers no share to the workman in any increased production he may effect by more intelligent exertion. The piece work plan offers no reduced labor cost per unit of product to the employer. The premium plan splits the difference between day work and piece work. It abolishes the abuses of either and combines the virtues of both the others. Not being compulsory, it simply offers opportunity for the energetic, ambitious and thrifty men to elevate their position in life by creating more with their given amount of brains and energy, 'Making two blades grow in place of one.' No man must do it, however, and if he does not excel, he gets the regular standard day's wage.

"It has been asserted by the enemies of the premium plan that it 'enables an employer to measure the labor he buys by standard units of quantity and quality, and to determine the value of each man's services.' This is true, and the knowledge is obtained by absolute and scientific means without prejudice, guess work or the assistance of 'shop lawyers.' It undoubtedly does 'establish an individuality among the workmen.' Instead of being mere human units of labor, all paid alike and all performing alike, it puts every tub on its own bottom. If these are wrong principles, then we are blameable. We cannot make, change or control the laws of competition, neither can any capital trust or labor trust change those laws or suppress human ambition. They are as fixed as the laws of gravity.

"The individual premium plan is in use in over thirty principal shops in Cincinnati, O., which city leads the world in the production of machinery. It is also in use by the most progressive firms in other sections of this country and Europe. It is a pronounced success to the employer and employe who use it, as it automatically

reduces cost and simultaneously raises wages proportionately, giving the employer what he needs, lower cost of output, and to labor higher wages per man, with no loss to any one, simply elimination of the present waste.

"We have a letter from a big firm in the west, stating that for the week ending Dec. 20, 1902, the total schedule time allotted for jobs equaled 18,236 1-4 hours; total time actually taken to do the work, 7,572 hours; total time saved, 10,664 1-4 hours. One-half the time saved was paid the men at their regular hourly rate, amounting to $948.64, in excess of prevailing day's wages, or $4.80 extra per week per man. The earning of this same shop for thirteen months, as published in the *American Machinist* of last June, averaged for boys, handymen and machinists eighty-three cents per day per employe, in addition to prevailing rate of wages. We shall be glad to show the letter and article to any one interested.

"Our own experience of this plan may be summed up briefly as follows: When we operated this plan a few years ago, making shells for the United States navy during the Spanish-American war, the average of several men over a long period showed that the lowest premium earnings in each week during that time was 12 percent, and the highest 135 percent, premium paid in addition to regular hourly rate of wages. The average increased earnings were 45 percent.

"Two instances may be cited that occurred during the week ending January 17, 1903, just before the trouble. A drill press hand whose regular rate was 20 cents per hour, earned 25 cents per hour by running his drill faster; another, a lathe hand, rated at 27½ cents per hour, earned 43 cents per hour by more intelligent application of the tools to the work.

"It has been repeatedly stated by the enemies of this plan that it exhausts men physically. If any one will consider this without prejudice and with calm judgment, they will realize that the operator of a machine cannot be exhausted physically by any increased output of his machine. It is just like saying that a locomotive engineer running his engine forty miles an hour suffers more physical exhaustion than another running thirty miles an hour. The truth of the matter is, the man must apply himself more mentally and 'tend to his knitting,' but we have never seen an instance in all our experience, of physical injury resulting from this cause, and doubt if any medical journals have records of such a case. There is, however, quite a demand for seat cushions for this class of labor.

"The opposition to this plan has never been presented to us by any logical argument against it, or by any business reasons, but simply by threats that an organized conspiracy would prevent our engaging other men, and prevent the sale and delivery of our product, so as to ruin our business. We have not been shown any point about the plan that is wrong in principle or that works an injustice to any employe, but we do possess the absolute and undisputed proof of its value to us, and to our men in the past.

"The union leaders and committeemen who objected to this plan were informed that it was an absolute necessity that we reduce our cost and increase our output in order to meet competition. If they did not like our plan and had any better plan, we would take it up. They had none, and therefore we considered it would be the square, businesslike and manly act for both the men and the company to try this plan.

"We repeat distinctly that while there have been a dozen different demands made on us through the newspapers, there never has been in this case but one single demand by the union machinists, namely, the withdrawal of the premium plan, and we make this proposition in reply to that one demand:

"If the union will put up a surety bond to guarantee that our cost of production of engines shall not exceed a specified amount, we will turn the shop over to them to run as they please, or if they will buy us out, they can make their own shop rules, and do as they please; but if we cannot get a return consideration, we cannot see how we can meet their demands, and we take the liberty of retaining the privilege of conducting our business as we deem best with due regard to the rights of our employes.

"We cannot see why, in a free country, we should cringe to unjust and unlawful demands of a secret order of men, any more than we should to an unjust attack by one individual. A strange and unaccountable instance of distorted vision is shown by one prominent union machinist, expressing his horror and indignation at our men being offered the premium plan, while that same apostle of organized labor and many more work every day under a cast iron piece rate scale in a shop not 1,000 miles from ours."

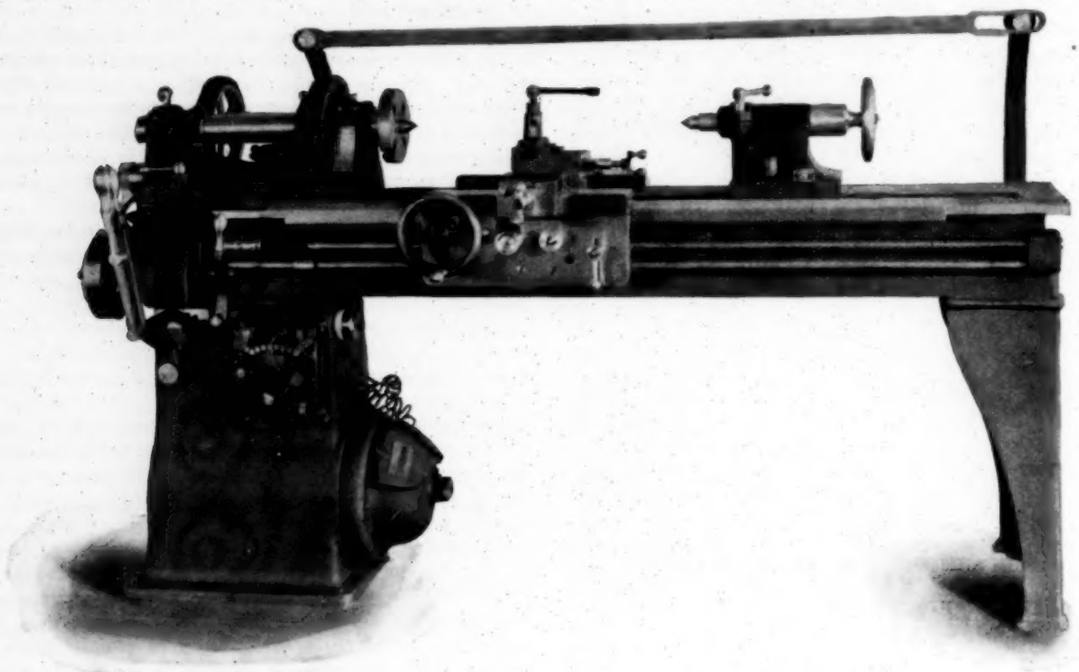


FIG. 1.—14-INCH MOTOR LATHE WITH CABINET OR BOX LEG UNDER THE HEAD STOCK.

The Niles-Bement-Pond Co. has taken a large British order for machine tools.

A NOVEL MOTOR-DRIVEN LATHE.

The halftone shows an exceedingly interesting application of a motor drive which is so arranged as to avoid the use of belts, chains or similar connections. Incidentally there is also provision for sundry changes of speed without complicating the electrical apparatus and in this way also there is an additional choice in the selection of a motor in the first place.

Fig. 1 shows a 14-inch lathe with cabinet or box leg under the headstock. The motor is placed in the lower part of the leg and it may be pointed out that while in the present instance the motor is applied on the right hand side of the column it may equally well be applied at the left. The projection of the motor from the column is but slight in either case. When the motor is located as shown in the illustration a plate is cast in the lathe bed in order to protect the motor from all chips and dirt falling from

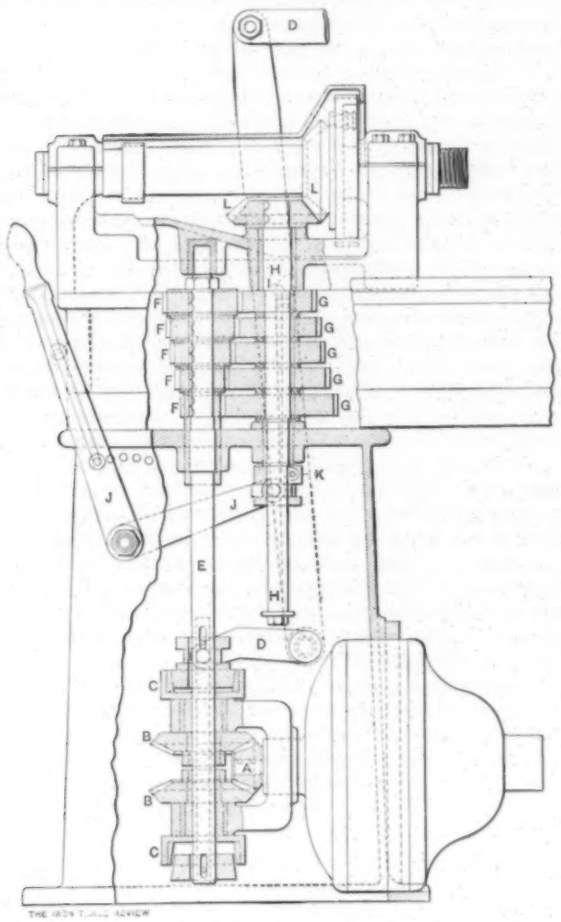


FIG. 2.—SECTIONAL VIEW OF COLUMN AND DRIVING MECHANISM.

the work, etc. The body of the motor is held firmly in place by means of lugs fastened to the frame and in turn screwed to the leg. The inner end of the motor fits into a hole bored in the cross ties cast in the supporting column.

On reference to Fig. 2, which shows a sectional view of the column and driving mechanism, a rawhide pinion is shown on the end of the armature shaft. This pinion A meshes with metal gears B B; rotating them of course in opposite directions. These bevel gears are keyed to the frictions C C and are connected or disconnected by the lever D. The controlling lever, which takes the place of the ordinary belt shipper and starts, stops and reverses the lathe, runs the full length of the lathe bed and is at all times convenient to the workman. Five metal flanged rawhide gears, F, of different diameters are keyed on the upper end of the shaft E; these gears are in mesh with five corresponding gears G, which run loosely on the shaft H. These gears are connected to the shaft H, one at a time only, by means of a sliding key I, which slides in a spline cut in the shaft.

When the key I is moved from gear to gear by means of a lever J, it is depressed flush with the shaft by passing under the collars placed between the gears G. The key must therefore be entirely out of the one gear before the springs placed under the key can force it into the keyway in another gear, and there is consequently no way by which more than one gear at a time may be connected to the shaft H.

A bevel gear L on the upper end of the shaft H meshes with a similar gear which takes the place of the usual cone pulley. The back gears are operated however in the customary manner. The lever J is very convenient for the operator and may be moved while the lathe is running; giving a handy method of feed control which has none of the awkward and time losing features of a belt and stepped cone combination.

The drive is so arranged that the motor may be removed for inspection without disturbing any other part of the machine. Another feature of considerable importance is the location of the motor near the floor. This position does not expose the mechanism to injury from chips, etc., on account of the protective design which has already been mentioned, and on the contrary the position decidedly brings the center of gravity of the whole machine nearer to the base and thus avoids the swaying or vibration which would probably accompany a different location of the motor.

The lathe has evidently been so designed that about any make, speed or style or motor, either direct or alternating current, can be employed and the machine allows a wide range for individual selection of power equipment. This machine is manufactured by Flather & Co., Inc., of Nashua, N. H.

30,000-Ton Rail Inquiry from Siam.

Regarding the 30,000-ton inquiry for rails for Siam, mentioned in our last issue, United States Vice Consul General Joseph P. Selden writes to the State Department from Bangkok under date Dec. 15, 1902: "The Royal Siamese Railway Department has just issued specifications for an open tender on 33,806 tons of steel rails and accessories. These supplies are for the railway which is to extend from Lopburi, the present terminus of the branch line of the Korat Railway, to Chiengmai, a city in the northern part of the country. The time limit for bids on the tender is six months, i. e., from December 15, 1902 to June 15, 1903. All bids must be in on the last-named date. The sealed bids are for the first time to be opened in public. I forward a set of specifications, conditions and blue prints to the Philadelphia Commercial Museum. I inclose a notice of the tender, which appeared in the local papers last evening." The notice states that tenders are requested for the supply of the following permanent way materials: Rails, 30,000 tons; dog spikes, 950 tons; fish plates, 1,826 tons; bearing plates, 750 tons; bolts and nuts, 270 tons; spring washers, 10 tons. Total, 33,806 tons. Drawings and conditions may be obtained against payment of 5 ticals (about $1.25), at the office of the Royal Railway Department. Sealed tenders, with the inscription, "Tender for the supply of permanent way materials," must be forwarded before June 15, 1903.

The officers of the Lake Shore Railroad are figuring on the work of a general extension of side track over the entire system between Buffalo and Chicago. During the coming summer many thousands of dollars will be expended for this purpose. A large number of new bridges will be erected.

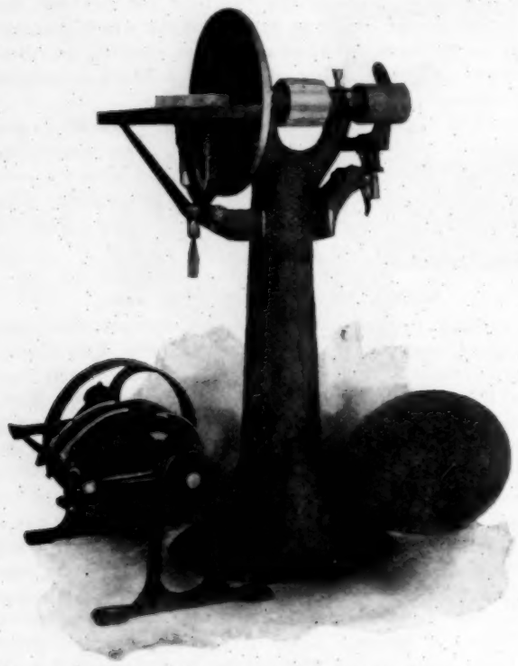
The Star Drilling Machine Co., Akron, O., has secured a contract through Tata & Co., New York, for considerable drilling machinery, which is intended to be utilized in the iron ore prospecting operations now being carried on in the Chanda district, central provinces of India, in which Mr. Tata is primarily interested.

PATTERNMAKER'S UNIVERSAL SANDING TRIMMER.

The machine illustrated is the outgrowth of some three years' study and shop test. It is the invention of a patternmaker and is manufactured by the Collis Pattern Works, of Dubuque, Iowa. As will be seen on reference to the illustration, it is a combination tool; at one end of the main spindle being a 15-inch disc and at the other end a roll 3½ inches in diameter. An 8-inch roll can be used should this be necessary, but as sent out the machine is supplied with two 15-inch discs and a 3½-inch roll.

There is a tilting table in front of the disc which may be swiveled up or down or set square by means of an arm which engages the under side of the table and is pivoted on the end of the roll hinge. This hinge is also used when the workman desires to drop the table away from the disc in order to grind large surfaces. There is a movable gauge on top of the table for grinding bevels, angles, etc., forming a very handy attachment, having special value for duplicate work.

The roll placed at the opposite end of the main spindle is of course intended for grinding concave surfaces. There is a gauge or vertical table at the side of the roll which can be set to any required angle, either obtuse, acute or



PATTERNMAKER'S SANDING TRIMMER

square. The gauge can be instantly moved to any part of the roll and clamped by means of a screw which closes up the split bearing, or the gauge may as conveniently be removed entirely.

The spindle is made of machine steel and fitted to wick-oiling bearings. These bearings have been so arranged that there is little or no chance of grit getting at the spindle and cutting it. All the rotating parts are carefully balanced. The countershaft is of a strong but light pattern with one 12-inch and two 8-inch pulleys, which are also carefully balanced.

The makers recommend the use of No. 1½ garnet paper for wood working, and emery cloth for use on metals. These are applied to the discs in the following manner: Remove the disc from the spindle when the sand paper or emery cloth is worn out, make it sufficiently warm to remove the old paper in one piece, giving the new paper one thick coat of shellac, and place on the disc at once, using the extra disc as a face plate; no other clamping being thus necessary. This operation can be completed in five minutes and in this way both discs may be renewed at once, should this be required. The sand paper is applied to the roll in a similar manner and is retained in place while cooling by winding a cord around the roll to hold the ends of the paper in position.

CONCERNING THE "TECHNOLEXICON."

The need has long been felt of a technical dictionary comprising a complete vocabulary of terms of all the industries and their many branches. The National Society of German Engineers conceived the idea of publishing such a dictionary under the title "Technolexicon," making it as comprehensive and complete as possible, and soliciting at the same time the co-operation of other technical and industrial societies, domestic and foreign. It was decided to publish the dictionary in the three mostly used languages—English, French and German. In March, 1901, work was started with an announcement in the journal of the Society of German Engineers, and shortly afterward printed information was sent to technical societies and individuals in Germany and other countries, telling how contributions to the "Technolexicon" could be made by anyone in touch with industry and with technical and engineering work.

Dr. Hubert Jansen, whose name has already become connected with other encyclopedic works, was elected editor in charge. Dr. Jansen, at the 43rd general meeting of the Society of German Engineers, held in Düsseldorf at the time of the exposition, to report about the progress of the work. An idea of its comprehensiveness may be gained from the statement of Dr. Jansen that though words have already been gathered for one and a half years by societies and individuals in Germany, Belgium, France, England and the United States, the collection will probably not be completed before the end of 1904, when the compilation of the contributions will begin. This will occupy about two years, so that the manuscript will be ready by about the end of 1906, after which it will go to the press. Dr. Jansen says that not only are contributions of technical terms with the translation for them valued, but also contributions which, in giving the technical term give at the same time an explanation thereof, indicating in what sense or in what connection the term is used. Contributions regarding customary phrases as used in the technical language of the country are highly appreciated. If terms which are very uncommon are communicated, it is desired to have at the same time the source of such terms.

The principal sources for the "Technolexicon" are, of course, these contributions, but of great value also are catalogues, price lists and other printed matter of industrial firms, from which the technical terms can be gathered by the assistant editors and other collaborators of the editorial staff of the "Technolexicon" in Berlin. It is highly desirable, therefore, in order to further the work, that all manufacturing firms publishing printed catalogues, price lists, etc., send copies of their printed matter to the "Editor of the Technolexicon, Dr. Hubert Jansen, Berlin, N. W. (7), Dorotheenstrasse 49." Such co-operation is believed to be in the interest of such firms, as the "Technolexicon" once completed will undoubtedly prove a valuable help in translating catalogues from one language into another. All those who may desire to contribute by collecting terms and phrases, may apply for note books especially arranged for that purpose, and for letters of information directly to Dr. Jansen or to Dr. Alfred Mueller, 150 Nassau St., New York City.

The Syracuse Foundry Co., Syracuse, N. Y., has had its plant in operation since Dec. 29 last, has an abundance of orders on hand, and most encouraging prospects. The officers are: Robert Love, president; Louis H. Kruger, vice president; Floyd R. Todd, secretary and treasurer; George J. Hessler, general manager.

The Illinois Central has placed a contract with the American Car & Foundry Co. for 2,000 freight cars, to be 80,000 pounds capacity.

NEW BOOKS.

"Dies, Their Construction and Use," is the title of a cloth-bound treatise on the modern working of sheet metals, and discusses the design, construction and use of press tools. The book is a timely contribution to the scanty store of literature devoted to the power press. The use of this machine has rapidly developed during the last few years, and has become an important factor where numerous pieces are required of sheet metal. For exceptionally light work the press has a field peculiarly its own, and can produce articles that are manifestly out of the question by any other process. The uniformity of the work made in such a manner is of decided value in interchangeable manufacture. The author, Joseph V. Woodworth, is evidently in touch with modern work of this character, and in his book has discarded any reference whatever to what may be termed the history of the art, and has directed his attention exclusively to such methods as are today utilized in increasing the output and lowering the productive cost of sheet metal products. His book covers 384 pages, 6x9, and contains 505 illustrations. This suggests the broad manner in which the author has handled his subject, though it must be admitted that the engravings are of very unequal merit. The majority of them, however, are excellent wax reproductions showing the dies and press fixtures with great clearness. The remainder of the illustrations apparently have been obtained from sources where they had already done considerable service. The numerous and excellent examples which the author has selected to illustrate the utility of the press are handled in a very satisfactory manner, and the introductory chapter of the book presents a well thought out method for the construction of blanking dies. These, by the way, are made in the American or English style, as it is sometimes characterized in order to indicate a difference between that system and the French method. In the former method the punch is finally sheared to exact size by being shaved by passage through the hardened plate. The French system is the reverse of this. The writer has confined himself to the better-known and probably the most satisfactory system. Something might have been said in greater detail regarding the broaching press and its serviceability, and additional information might have been given in regard to dies used in the manufacture of tinware, wiring, etc., but these are not entirely overlooked and the book itself is so practical in character and covers so wide a range that it will be found a decidedly useful production. The price is $3.

Mr. Woodworth is also the author of a cloth-bound treatise of 288 pages, illustrated by 201 engravings, devoted to the "Hardening, Tempering, Annealing and Forging of Steel." This discusses the selection of material, the most approved methods of heating, hardening, tempering, annealing and forging, the use of gas blast forges, heating machines and furnaces, the annealing and manufacture of malleable iron, treatment and use of self-hardening steel, with special reference to case-hardening processes. The author also discusses the hardening and tempering of milling cutters and press tools, the use of machinery steel for cutting tools, as well as drop forging and grinding processes for tools and machine parts, etc. In this instance, as in the preceding volume, an effort has been made to bring the treatise up to date in a practical manner, and on this account the main effort has been directed toward tried and accepted methods rather than originality, and in this the author has been assisted by a number of prominent firms. The book is therefore quite practical, not to say shoppy, in treatment. Both this and the volume referred to above have the benefit of a very complete index. The price of this work is $2.50 and the two books are published by Norman W. Henley & Co., Nassau St., New York.

The number of technical pocket-books already on the market would seem to leave but little room for a justifiable volume along the same line, but the booklet published by the International Text Book Co., of Scranton, Pa., has some special features of interest, and during the few years of its existence has had a sufficiently wide circulation to testify to the demand and usefulness of such a work. The book is entitled "Mechanics' Pocket Memoranda." It is a leather-covered volume, 3¼x5 inches, and contains 328 well-indexed pages, and has passed to the sixth edition; the first edition having been issued in October, 1893. It would seem from the dimensions that the book is intended to be a pocket-book in fact, and for that reason has been kept conveniently small in compass. The contents have been concisely arranged and the selected matter has been chosen with considerable tact and is as a rule of an every day usefulness. The work was especially designed to meet the needs of the students in the engineering studies conducted by the International Correspondence Schools; for this reason it contains considerable elementary material. There is, for example, an excellent article on the use of formulas, and in many other respects the work handles various tables and other data in an elementary and lucid manner, well adapted to the class for whom the book is specially intended. The price is $1.50.

The Derry-Collard Co., of 256 Broadway, New York, will publish a series of practical papers dealing with machine shop problems and their solution. The first of these has just appeared and is entitled "Turning and Boring Tapers," by Fred H. Colvin. The present and the succeeding pamphlets will be of uniform size and style and may be bound together or kept separately as desired; a neat case for holding ten being furnished at a nominal cost. The pamphlets are limited to a single subject in each paper and the purchaser may thus secure the information he desires without the necessity of buying a large volume, nine-tenths of which might not be useful to him. The pamphlet covers 23 5½x8-inch pages, and the subject matter is freely illustrated with good engravings. The article is tersely written by an able mechanic and will clear up many of the puzzles in regard to tapers, the influence of centers, the length of stock relative to tapers, compound rest graduations, etc. The price is 25 cents.

The Peril of Labor Unions.

In an interview in New York, a few days ago, James J. Hill, president of the Northern Securities Co., said: "As labor unions killed industrial England, so are they destined to bring about a grave financial reverse in the United States, and the country is swiftly approaching that crisis. It may come in a year; it may be deferred till the presidential year, but it is bound to come."

"There seems to be too much confidence in the ability of the country to walk right ahead of all other countries in manufacturing," continued Mr. Hill. "The country can do it, but not without trouble, and not without changing its present course. It is indeed a grave crisis we are approaching, although few seem to appreciate it. A few years may see the closing of many factories and the throwing out of work of hundreds of thousands of men. We have been reaping the harvest, and the reverse is coming. How quickly we recover from it will depend largely on who is at the head of the country when the break comes."

Steel Corporation Orders Increase.

United States Steel Corporation officers report a further accumulation of orders, and it is estimated that by April 1 unfilled orders on the company's books will aggregate 6,000,000 tons. An official statement issued recently showed unfilled orders of 5,509,000 tons. If the orders continue as they are coming now the production of the corporation for 1903 will be sold within a few months. An interesting comparison made with the situation on Nov. 1, 1901, shows at that time unfilled orders amounting to 2,831,690 tons. Practically there has been an increase every month since then. On Nov. 1, 1902, the amount of unfilled orders was 4,968,000 tons, and on Dec. 31, 1902, 5,247,253 tons. If on April 1 such orders amount to 6,000,000 tons it will show an increase of 110 percent, as compared with Nov. 1, 1901.

CAN LABOR CONTRACTS BE MADE BINDING?

Henry W. Hoyt, of the Allis-Chalmers Co., has a brief article in the first issue of *Commercial Expansion*, a new Chicago magazine, on labor contracts and the possibility of enforcing them. We make the following extract:

"At the annual convention of the National Founders' Association, held in Detroit, in November, this matter was discussed to a considerable extent, and a motion looking towards instructions to the administrative council of the association to insist upon the incorporation of the Iron Molders' Union of North America was withdrawn. It was shown that the difficulty of securing the assent of the Iron Molders' Union to incorporation was not the only one to be considered. When the question of incorporating the National Founders' Association was suggested, it was discovered that there was not a complete unanimity of sentiment, even among the employers, as to the wisdom of incorporating their association. It was suggested that in the event of a national agreement being made between the National Founders' Association and the Iron Molders' Union of North America, it might be a good plan to insist upon a reasonable financial bond to be given by both parties to secure the faithful performance of the joint agreement. It was thought that such a plan might be safely proposed by the National Founders' Association and urged upon the Iron Molders' Union.

"All associations, whether of employers or employes, usually have an available treasury fund, and in the absence of incorporation, the funds of the association might be pledged as a safeguard. Having made an agreement, safeguarded by a bond on both sides, the question would naturally arise as to the proper tribunal before which to bring any matters of dispute relative to the carrying out of the agreement. It was believed that this difficulty could be overcome if both parties were in earnest in endeavoring to reach a basis of operations where good faith should be pledged by both.

"After all, the good faith and integrity that enter into the agreements between employers and employes are the real foundation for success. If they are lacking, a financial bond might not be of much value in enforcing such agreements. The benefits of incorporation seem to be many, but the chief one is that it would have a strong influence toward increasing the sense of responsibility and improving the discipline among the individual members and local unions. There seems to be a very widespread and general feeling of irresponsibility among workmen who belong to unions. Agreements are entered into lightly and broken recklessly, not by the chief officers of the unions but by those individual members who have never felt the restraint of business discipline or legal liability. It is not unlikely that the national officers of many unions would favor incorporation if it were not for the fear that this sense of irresponsibility on the part of the rank and file would plunge their organizations into constant litigation and danger of dissolution. At the same time there is little doubt that any movement towards the inculcation of a better sense of individual responsibility among workingmen would be favored by the real labor leaders of the country."

The Philadelphia Pneumatic Tool Co. has arranged to double the size of its offices in New York by renting additional room in the Singer Building, corner Broadway and Liberty Sts. This is made necessary by the greatly increasing business of this company in and around New York City. An electrically driven air compressor and a complete plant for testing and exhibiting pneumatic tools of all kinds in operation will be installed. The New York offices will continue under the management of W. A. Battey assisted by James H. Beaubien. Orders have been recently received by the Philadelphia Pneumatic Tool Co. for complete equipments for pneumatic tools for the National Railroad of Mexico and for the Interoceanic Railroad of Mexico. In two days last week this company shipped Keller rotary drills to the amount of over $10,000.

The German machinery house of Schuchardt & Schutte has placed a contract with the Tabor Mfg. Co., of Philadelphia, for molding machines to be shipped to Cologne.

FLUORSPAR IN THE OPEN-HEARTH FURNACE.

G. W. Burman, F. C. S., writes as follows in the London *Iron and Coal Trades Review*, on the use of fluorspar in the basic open-hearth furnace and its effect on the solubility of basic slag:

Fluorspar, although having its advantages in acting as a flux, producing a thinner and more liquid slag, and assisting in the desulphurising and dephosphorising of the pig-iron, has a decided disadvantage in the effect it produces on the basic slag made. The slag, which is ground to a fine powder, is sold as an artificial manure on account of its richness in phosphoric acid which exists in combination with the lime as phosphate.

It is advisable that the phosphate should be in such a condition that the nature of the soil in which it is put will absorb the phosphoric acid. According to Professor Wagner's article on the citrate solubility of basic slags, slag is now bought, not alone on the total phosphoric acid it contains, but on its basis of solubility.

The use of fluorspar (which is a fluoride of calcium, CaF_2), has led the author to take this matter up and he finds that its action is very detrimental to the citrate solubility of basic slags. Compounds of fluorine are readily decomposed, but when fluorine is liberated from one element it instantly seizes upon another. This is not so in the case of oxygen. From numerous experiments, the author has come to the conclusion, that in the case of the basic slag produced, the fluorine liberated from the fluorspar attacks the phosphorus, producing a compound of fluorine with phosphorus of the nature of fluor apatite $3\ Ca_3\ (PO_4)_2 + CaF_2$, which compound contains the insoluble phosphoric acid.

To determine this accurately would require a knowledge of the ratio of the fluorine to the insoluble phosphoric acid. The author carefully made analysis of his experiments where varying amounts of fluorspar had been used (1 to 10 cwt. in an 18-ton charge), and has found the solubility to diminish considerably. The following table shows the results of slags treated with and without fluorspar:

	With the Addition of Fluorspar.			Without Fluorspar.		
Amount of Fluor Spar used.	Total Phosphoric Acid.	Soluble Phosphoric Acid.	Solubility.	Total Phosphoric Acid.	Soluble Phosphoric Acid.	Solubility.
Cwts.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
2	17.66	7.42	42.0	15.72	13.3	84.6
3	15.37	2.56	16.6	14.93	13.18	88.2
1½	15.81	8.44	53.3	15.75	14.30	90.8
6	15.81	3.45	21.8	17.07	13.33	83.9
10	13.43	.78	5.8	16.26	14.12	86.8
5	15.84	3.82	24.1	15.75	13.43	85.2

Verdict Against Policemen for Strike Arrests.

Two cases growing out of the strike at the Worthington Pump Works, in which one of the strikers, Michael Flanagan, was arrested by policemen, have just been tried in New York. In one case Flanagan was awarded $100 and in another the verdict was for six cents, both suits being against policemen. In charging the juries, Judge Gaynor said in part: "There was no reason for police interference unless some offense was committed; then, if an officer should see it, it is his duty to make an arrest. The officer had no more right to arrest men who were walking peaceably in the street than he had to go in the place and arrest the proprietor. The police cannot arrest right and left. They can only arrest by law. These men had a perfect right to go out and speak to passersby and tell them not to go to work as a strike was on. So long as they did nothing unlawfully, and did not obstruct the streets, and were orderly, the officer had no right to make an arrest."

The annual convention of the National Association of Manufacturers of the United States, will be held April 14 to 16 in New Orleans, La. It is anticipated that the convention will be one of the largest in the history of the organization.

THE SIMPLEX SYSTEM OF COOLING WATER.

The cooling of water to be used again in condensers, provided a simple means of cooling is supplied, is becoming a more general method of obtaining suitable condensing water. The increased requirements for cooling water, due to enlargements of plant, but especially the trend of modern blast furnace construction whereby the cooling elements have been doubled and quadrupled, and condensing plants and other water consuming accessories added, would seem to make it profitable, and in many cases necessary, to reduce the waste of water as nearly as practicable to that evaporated into the air or absorbed beyond recovery into the earth.

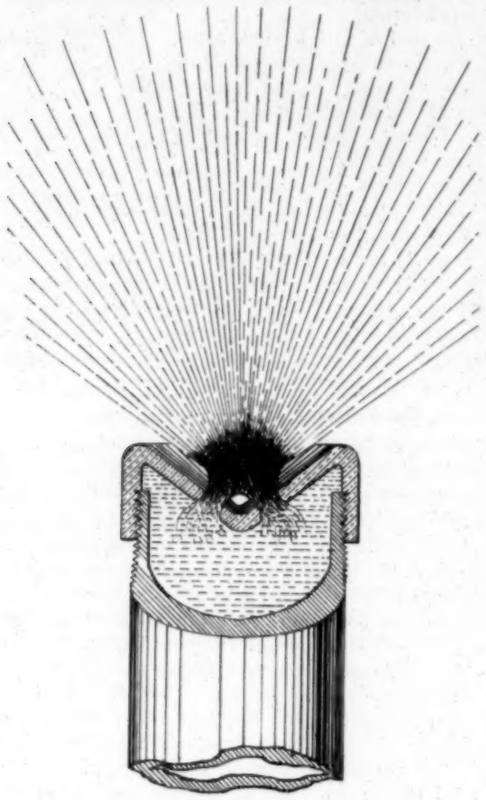


FIG. 1.—SIMPLEX NOZZLE FOR COOLING WATER.

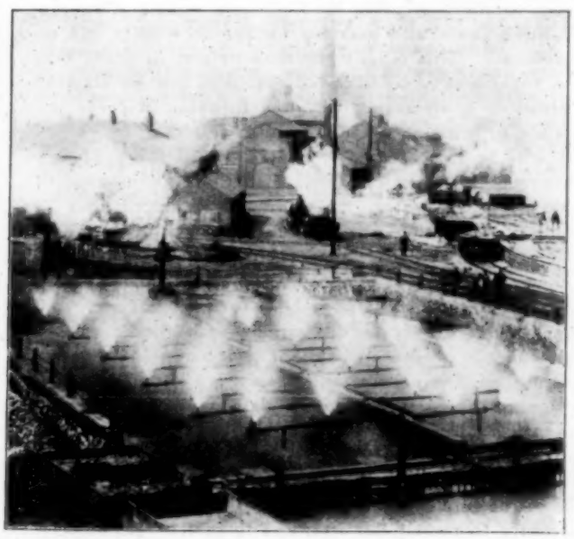


FIG. 2.—SIMPLEX NOZZLES COOLING 50,000 GALLONS PER HOUR OF BLAST FURNACE TUYERE WATER.

There is nothing new in the cooling system herewith illustrated, but it is noteworthy for its simplicity and efficiency, gained by the use of the patented spray nozzle shown in Fig. 1. Figure 2 shows a plant in operation cooling 50,000 gallons of tuyere water per hour. The water flows by gravitation from the discharge through to the nozzles. Since a head of 10 to 15 feet is sufficient to produce an effective spray, it is only in rare instances that pumping is required. In many cases, even where water is abundant, its source is generally a river or creek requiring heavy pumping to bring it up to the level of the furnace plant. The greater part of this pumping can be saved by a reservoir and cooling system. The difficulties due to muddy water at high stages or filthy water at low stages of the creek or river are reduced to a minimum or avoided.

The Simplex spray nozzle is made of gun metal, the central portion being in the form of an inverted hollow cone, having two holes through the side set at such an angle with each other that water passing through them from the lower side forms two streams which strike each other, and are thus broken up into fine particles or spray. In this form the water offers a very large surface in proportion to its bulk, and which is freely acted upon by the atmosphere as it falls through into the tank or pond below. A small portion is thus evaporated from the surface of each drop of water, which has the effect of cooling the remainder to very nearly the temperature of the atmosphere. In cooling condensing water it is found that the amount thus evaporated is slightly less than the boiler feed, or, say about one-thirtieth of the water to be cooled. Another application of the nozzle is for the cooling of material which is loaded hot into gondolas, as is often the case with cinder. When fitted for hose connection, it is well adapted to cooling the iron and wetting down the sand in the cast beds. By permanently arranging the proper number of nozzles in the reverse order to that shown in fig. 2, any desired space may be uniformly wet down with a minimum amount of water by simply opening and closing a valve.

The system is being introduced by Ed. A. Uehling, 135 Broadway, New York.

The New Department of Commerce.

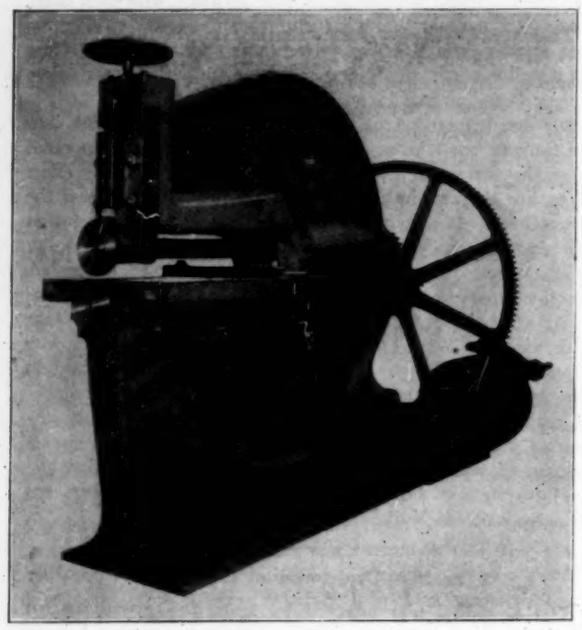
The new law just enacted by Congress providing for the department of commerce and labor creates a bureau of manufacturers and a bureau of corporations. The bureau of manufactures is to foster manufacturing industries, by publishing reports and furnishing information. The bureau of corporations will, under the direction of the secretary, have charge of publicity in connection with the business of corporations engaged in interstate and foreign commerce. The commissioner of corporations is given power to make diligent investigation into the organization, conduct and management of the business of any corporation, excepting common carriers, and to gather such information and data as will enable the president to make recommendations to Congress for legislation for the regulation of such commerce, and to report such data to the president, from time to time as he may require. This information, or as much thereof as the president may direct, shall be made public. The commissioner is given the same power and authority in respect to corporations engaged in interstate and foreign commerce as is conferred on the Interstate Commerce Commission, including the right to subpoena and compel the attendance of witnesses and the production of documentary evidence.

The following bureaus which are now attached to other departments, or which have an independent existence, are placed under the jurisdiction of the secretary of commerce and labor: Lighthouse Board, Lighthouse Establishment, National Bureau of Standards, Steamboat Inspection Service, Bureau of Navigation, United States Commissioner General of Immigration, Commission of Immigration, Bureau of Immigration, Bureau of Statistics, Census Office, Fish Commissioner and the Bureau of Foreign Commerce.

The American Locomotive Co. has secured a contract for twelve locomotives to be shipped the Kuishi Railway, Japan.

GAP ROTARY SHEAR.

A type of gap rotary shear, recently brought out by the George Whiting Co., of Chicago, embodies several features overcoming the troublesome effects often met in such machines. The main frame has been designed with the view of eleminating spring when cutting, springing being a not uncommon fault. The cutters are made as small in diameter as a shaft of proper stiffness will admit, thus enabling discs of a smallest possible diameter to be cut out. They are also made flush in front, allowing the cutting of legs of angles or flanged work. The upper cutter is adjustable vertically for different thicknesses of stock and the lower cutters has a horizontal adjustment for



GAP ROTARY SHEAR.

taking up wear. Both cutters are fitted with special thrust bearings to obviate wear as much as possible. As will be seen in the cut, the cutter shafts are exceptionally heavy with extra long bearings. Shaft gears are cut from solid blanks. The ratio of the driving gears is unusually large, this enabling a much lighter driving belt to be used. Pulleys are mounted in heavy back stand and rigidly bolted to main frame, forming a much better bearing than the common over hanging type.

The shear is especially well built, and with its use it is possible to cut straight and curved lines as desired.

New Armor Plate Contracts.

Bids were opened at Washington, Feb. 12, for supplying 11,332 tons of armor for two new battleships and two armored cruisers. The Carnegie Steel Co. and the Bethlehem Steel Co. each bid on a battleship and a cruiser, $2,333,640, and each company will supply 5,666 tons of armor. This is at the average rate of about $412 a ton. The contracts in the past called for not less than 400 tons a month. Both companies are now spending over $1,500,000 apiece for extensions which will be finished in the course of a year. After that the output will be increased to over 600 tons a month. At the present capacity of each company's plant the contract will require at least a year's work. This armor will be used on the battleships Connecticut, building at the Brooklyn navy yards by the government, and the Louisana, building at Newport News, by the Newport New Shipbuilding Co.; and for the armored cruisers Tennessee, building at Cramps' in Philadelphia, and the Washington, building at the New York Shipbuilding Co.'s yards in Camden, N. J.

NEW ENGLAND FOUNDRYMEN'S ASSOCIATION.

The February meeting of the New England Foundrymen's Association was held in Boston, Wednesday afternoon and evening, Feb. 11, with 42 members and visitors present. The following firms and individuals were elected to membership:

N. S. Bartlett & Co., Boston, Mass.

J. E. Plimpton Co., Norwood, Mass.

Springfield Facing Co., Springfield, Mass.

Walter M. Sanders, Providence, R. I.

D. C. Warner, Eastern manager *The Iron Trade Review*, New York City.

Whitehead Bros., Providence, R. I.

Old Colony Foundry Co., East Bridgewater, Mass.

Frank B. Foster, South Boston, Mass.

The paper of the evening was by Dr. Richard Moldenke, of New York, secretary of the American Foundrymen's Association, whom the New England Association unanimously elected an honorary member at this meeting. The paper is issued as part of the journal of the American Foundrymen's Association. It is as follows:

The Valuation of Foundry Pig Iron.

When I presented a memorial on this subject to the American Foundrymen's Association in convention in Boston last June, I realized very fully that it was a radical step which was certain to be objected to by furnacemen generally. I did it to invite discussion, suggested a possible method of solving a problem which has long faced the foundryman who has to make castings for the severest service; and my only motive was to assist in raising the standard of the foundry trade another step higher.

It is very obvious that improvements should be made at every stage of the casting process. Then why not improve at the very starting point—the pig iron? We all realize that however we may specialize in our work, the jobbing foundry will always be with us, and no foundry pig iron worthy of the name need be left on the hands of its makers for want of work to cast it into. On the other hand, the founders of specialties, who have helped make this country so great as a manufacturing nation, are entitled to—nay more, should demand—perfection, as near as it can be attained, in their raw material. When they feel reasonably certain that they have the best pig iron obtainable, the best fuel, the most efficient melting processes, molding, pouring and cleaning outfits, then they will think again, and look for further economies and improvements. This is only the modern way of doing business, superinduced by lively competition, and we are truly desirous of co-operating with the furnaces in every way possible to bringing about improved results.

It will be remembered that I proposed the study and subsequent adoption of standard methods of judging the value of pig iron for our purposes. I urged that the chemical standpoint, now so generally accepted, was not sufficient where the highest measure of quality in castings is concerned; that we cannot by chemical means trace the weakening influences of poor blast furnace practice, which may be diluted by judicious mixing with good irons, but which should be detected and the poor material weeded out absolutely for important and special work; that even the most uninformed foundryman today knows that it is useless to test iron in the pig direct, because of the wide variation in strength due to the cross section, pouring temperature, and treatment in the casting house. This, outside of the furnace end of the proposition. It is therefore necessary to remelt this iron and to cast it into sufficient bars to get an idea as to its value for the work required. To do this with fairness and a reasonable chance of success, I recommended the use of a standard cupola, standard coke, standard conditions of charging, blast—in fact, the whole process accurately laid out, and standard test bars, possibly a dozen of them, from which to obtain the knowledge sought. The foundry industry is much indebted to the *Iron Age* for sending out circular letters of inquiry with reference to my proposal, which, by the way.

is only novel in the standardizing feature. In the issues of June 26th, and July 3rd, a number of replies are published, all of which give food for thought. In bringing out the subject, the *Iron Age* very rightly holds that the task is a prodigious one, and looks impossible, but that evidently American foundrymen have something of this nature in mind and therefore approved of its further investigation. The *Eisenzeitung*, of Oct. 16, the official organ of the German foundrymen, after giving the substance of the memorial, calls attention to the fact that German foundrymen have long felt the want of some such system, and urges concerted action to do something along the line indicated.

In studying the criticisms brought out by the *Iron Age*, the interesting fact develops that there is a unanimous and settled willingness to sell pig iron by analysis. The work of our well known pioneers in foundry progress has thus revolutionized the old selling methods, for nowhere is fracture mentioned. For this much let us be thankful. No one would have thought this possible in the few years that have passed since grading by fracture was attacked. All the furnacemen on record think that selling pig iron by analysis is sufficient. They do not, however, realize that the roll maker, the founder of car wheels, the maker of malleable castings for specified tests, use several brands of the best irons obtainable, all of the proper composition, for safety; and when, in spite of this and the greatest care everywhere, the rolls crack, the car wheels fail to pass, and the couplers will not stand up, first one brand of iron is cut out and then another, and thus the hitherto unsuspected iron is weeded out. Doubtless this iron might be a very good one generally, but if the foundryman had the means of knowing that his shipments were made while the furnace was under a cloud, he would rather give away the iron than put it into large rolls. Such irons, while showing the right composition, might be so badly burned in the making that normally strong pigs will break in two by simply letting them fall on a rail. The cupola and the hearth furnaces are not the only places where iron can be badly oxidized, but this is very difficult to trace chemically.

One of my critics holds that skillful foundry practice overcomes some defects in a pig iron. True, judicious mixing will dilute excessive evils, but the foundryman is not desirious of paying full prices for this privilege. The very thing the method I proposed is intended for—the discovery of undue oxidation—cannot be eradicated by any foundry practice for cast iron we know of now.

Several critics do me the honor of holding that my proposition is correct theoretically, in fact ideal, if only possible to realize; that no progressive furnaceman has anything to fear from it, while the unprogressive one has, and depends upon a mixture of his with other good irons. It is suggested that enough bars be cast to make certain of a fair showing, and that the lines be not drawn too tight. All thinking foundrymen will heartily endorse this, for they will always give the fairest interpretation to the tests possible under the circumstances—provided they see an honest attempt to deliver the best iron for the composition specified that can be made. I have never yet caused a single car load of iron to be removed from my yards. Whenever the standard was not met the price was revised, and the metal used for work of minor importance.

As there seems to be some misapprehension regarding the practical working of the physical test in addition to the chemical, it might be interesting to note how this will in all probability come about. The base price of a given iron will always be determined by the supply and demand; that is, ordinary market conditions. The founder who desires to have a guaranteed strength, as per the test proposed, will naturally be expected to pay for it. This the founder of rolls, car wheels, malleables, government work, special machinery and the list of other castings requiring the highest grade of materials will be glad to do. Wherever castings are made upon the strength and quality of which human life depends, there should be no question of price anyhow.

As the quantity of pig iron bought under such a test, at least for a long time to come, would be limited, there need be no serious interference with the yard arrangements at the furnaces; in fact I venture to prophesy that whenever a furnace has what is thought to be a specially good cast, it will be put to one side, tested, and the salesman armed with the report for selling to an advantage. This is done right along in the chemical sense with irons specially suited for acid steel production. Why not, then, for car wheels?

It is further held that the physical strength is not enough, but that shrinkage, scrap carrying capacity, clean and sharp surface, and the miscrostructure of the iron should be arranged for. This I consider entirely too elaborate, and in fact unnecessary so far as we know now. The plain transverse test is all that is necessary to show what is required when taken in connection with the composition. The contraction of an iron when in the standard test bar, is practically a matter of its composition, and that mostly in the constitution of the carbons. With the large standard test bars, adopted by the American Foundrymen's Association, the influence of the pouring temperature and the molding sand is practically eliminated, leaving the question of contraction of much less importance than was formerly thought to be the case. Of course in the absence of chemical data, a contraction test is very essential, but we are a little beyond that point at the present day.

So far as the scrap carrying capacity of an iron is concerned I have this much to say. This is also a factor of the composition. A high silicon iron will always carry more scrap than one that is low. My experience may differ from that of others, but I have always been able to hold the same percentage of scrap with any brand of iron of my required composition. I have found no difficulty in making castings from scrap alone when enough high silicon was added to get this element right, and enough manganese to cleanse the metal. I was rather astonished when told the other day that my experience in this line was away off, as the broker in question was selling pig iron comparatively low in silicon which was actually carrying 60 to 80 per cent of scrap. He was in turn astonished when told that the scrap was carrying his pig iron. But he was laying great stress on graphite in pig iron, and did not think the other things mattered much. All of which shows that there is still room for missionary work in pig iron circles as well as in those of the foundry industry.

We all remember the time when furnaces refused to sell pig iron by analysis. Then a premium was asked; in one case presented to me it was $2 a ton. Then the furnacemen yielded gracefully, and are now very glad to be rid of the grading disputes. Undoubtedly more attention is now given at the furnaces to turning out a more uniform product, big, densely graphitic pigs no longer helping out a low silicon cast. The result has been a direct benefit to the foundry trade as well as themselves. And so also will be the further improvement of the iron by increasing the demand for quality. The very earnest desire for a differentiation of the really good irons from the indifferent or really bad ones will not be thwarted by characterizing my proposal as "fundamentally wrong, unfair, impossible and undesirable;" as "opening the doors to controversy;" "only adapted for weak foundrymen," or asking too much "because steel men will not do it," and "foundrymen are not educated enough to get any benefit from it." These tests, whether the one I proposed or other better ones, will come when furnacemen are ready to look for customers again, and then evidence of good qualities will be a good argument for sales.

It is admitted that poor foundry practice, bad fuel, or even varations in the regular routine will bring about variations in results with the best of irons; that the character of the castings made from pig iron depends upon many conditions; but the fundamental idea remains that with good standards and fair conditions, a good iron should show up well in a remelting test. What the actual strength should be will soon be developed by the foundryman most interested; and gradually pig irons, while varying in composition from month to month, or day to day, as they come from the furnace, will not vary as much in corresponding quality as they do now.

19,250,000 TONS OF PIG IRON IN 1903.

Archer Brown, of New York, is quoted by the *Herald* as follows on the possibilities of pig iron production in the United States in 1903:

"A forecast of pig iron production for the coming year presents more than the usual difficulties. In recent years about the only element of uncertainty to be dealt with was new furnace capacity. It was a safe assumption that ores and coke could be had to run existing plants and that the railroads were eager and able to haul the stuff. Now we have to deal with an inadequate supply of fuel and, what is more, with a general breakdown of the railroads in meeting the greatly increased demands for transportation. We have the highest railroad authority for the statement that it will take a year for the large railroad systems to build up to the traffic demands of the country. Any forecast, therefore, which fails to deal with the traffic problem will be out of line.

"At the outset of 1902 I estimated the total production of the year at 17,750,000 tons. The actual output was close to 17,800,000 tons. For 1903 the production should crowd close to the 20,000,000 ton mark, but for fuel and railroad restrictions. As it is, we shall probably make 9,250,000 tons in the first half and 10,000,000 in the second half, or a total of 19,250,000 tons.

"Looking at the situation in detail, there are now twenty-one furnaces of large capacity building. These are mostly to provide for the expansion of the large steel works. They are as follows: Lackawanna (near Buffalo), four; Clairton (near Pittsburg), three; Sharon, Pa., two; Donora, Pa., two; B., R. and P. R. R., one; South Chicago (international Harvester Co.), one; Cleveland (Rogers, Brown & Co.), one; Detroit (M. A. Hanna & Co.), one; Toledo (Pickands, Mather & Co.), one; Colorado Fuel & Iron Co., two; Buffalo & Susquehanna Iron Co., Buffalo (Rogers, Brown & Co.), two; Lookout Mountain Iron Co. (Alabama), one. Besides these 21 entirely new, several old furnaces are undergoing reconstruction, and a large number are being strengthened and capacity increased by the addition of new equipment, such as stoves, blowing engines, boilers, etc.

"The 21 new furnaces, when all are completed and operating, will add something more than 2,000,000 tons annually to the country's make of pig iron. The reconstructed, and improved furnaces will in time add 1,000,000 tons more. The real furnace capacity at the end of 1902 was probably 20,000,000 tons. So that by the end of the current year the United States should have a capacity of say 23,000,000 tons, or about one-half the production of the world.

"We should not make the mistake, however, of expecting an output equal to capacity, no matter how favorable market conditions. To begin with, experience shows about 10 percent of capacity to be non-available, even in normal times, because of relining of furnaces, accidents and other causes beyond control. Then, of the large additions to plants now under construction, scarcely any can be made available until the last half of the year, and some of the largest producers will not be making iron until late in the fall. Lastly, it is a question whether it is physically possible to increase the coke output and add to railroad facilities fast enough to handle the new materials for these furnaces as fast as they are ready to use them. Few people realize what it means to keep a large modern blast furnace going. The ore required for one of 400 tons daily capacity is 600 to 800 tons, the fuel 400 to 500 tons, the limestone about 300 tons, while sand and other supplies bring the total up to about 1,500 tons of raw materials which, added to the 400 tons product, makes a total daily traffic of close to 2,000 tons, or more than a whole section of a prosperous Western State will furnish in agricultural products and merchandise.

"Assuming an output of 19,250,000 tons this year, will the country consume it? Last year we produced, in round figures, 18,000,000 tons, and consumed, in round figures, 19,000,000 tons, the difference of a million tons being accounted for by imports from Great Britain and Germany and by reduction of stocks on hand at the beginning of the year. Besides this, we imported largely of certain finished forms of iron and steel as well as of scrap. It is doubtful if the total of home production and importations in 1902 fell much below 20,000,000 tons. It is true that this was high water mark, so high, indeed, as to lead to much talk of 'crest of the wave.' It is not possible to indicate accurately the extent of increase of melt, but reports from a very large number of consumers lead to the belief that the new year is running more than 5 percent ahead of the old. Some have placed it as high as 10 percent. If any turn in the tide is impending it is, at least, not yet visible. A 5 percent increase in melt calls for another million tons, or a total of more than 20,000,000 tons of pig iron. It is difficult to see how we are to escape continued importations to keep our works supplied. The agricultural implement and cast iron pipe makers see before then their largest year's work, the great railroad systems are making provision for unprecedented outlays for equipment and extensions, so that in my judgment, we must move forward at least a year longer the much talked of evil day when the turn in business comes."

Manager of the Union Switch Signal Co.

Henry G. Prout, for sixteen years editor of the *Railroad Gazette*, has resigned that position to become vice president and manager of the Union Switch & Signal Co., one of the well known Westinghouse organizations. He has had an eventful career. When very young he became a soldier in the Union army in 1863, and served until the close of the war. He then entered the University of Michigan, where he was graduated with the degree of civil engineer. Service of four years for the Khedive of Egypt as major of engineers followed, a part of the time being spent in the Soudan. After his return to the United States he was for a year signal engineer of the company out of which the Union Switch & Signal Co. grew. The outlook for the business at that time was not encouraging and Col. Prout engaged in business in New York, until 1887, when he entered the service of the *Railroad Gazette* as the editor. In addition to successfully carrying on his work as editor, he was constantly active in other directions. He has given lectures in nearly all the engineering schools of the country and is now departmental editor of the railroad division of the new volumes of the Encyclopedia Britannica. In closing an appreciative review of Col. Prout's career, W. H. Bondman, in the current number of the *Railroad Gazette* says:

"The bare record of his accomplishment is probably enough for those who know him, but to the thousands who have enjoyed his writings and have been aided by them it gives an insufficient idea of his personalty. And yet, the literary quality of his work should give to a stranger an idea of his sturdy moral nature, of his intellectual integrity as well as of his intellectual activity. He earned and held and will always hold the respect, the affection and the good wishes of those intimately associated with him in the control of the *Railroad Gazette*. As a lecturer and as an after-dinner speaker, it is his simple dignity, as well as his graceful and clear expression, that compels attention to his serious purpose; for, even in an after-dinner atmosphere he always speaks, enlivened by real humor, with serious purpose. The sum of it is that he is inspiring. He has such a fund of general and specific information, such a love of truth and thoroughness, such a scorn for lying and carelessness, such a ready quality of human sympathy, that, with a faculty for memory cultivated and quickened by editorial habit, he can subordinate himself and skillfully direct conversation so as to draw out others. His friend is apt to appear at his best when talking with Prout."

The Supreme Court of Pennsylvania, last week dissolved the receivership of the Ellwood, Pa., plant of the Frankford Steel & Forge Co. Several weeks ago upon the application of Mrs. A. M. Devine, receivers were appointed for the purpose of preventing the removal or dismantling of the Ellwood plant but the supreme court reversed the decision, making it optional with the officers of the company whether they continue to operate the plant or not. However the court's order prevents the removal or dismantling of the plant.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

The Horsburgh & Scott Co., Cleveland, has been incorporated with a capital of $60,000. The company will manufacture gears for the transmission of power, general machinery and electric railway supplies.

The Car Wheel Grinding Shoe Co., of Niagara Falls, N. Y., has been incorporated with a capital of $50,000.

S. R. Balkwill, W. H. Snell, Louis Langlow, W. C. Bardsley and Joshua Peirce, prominent citizens of Tacoma, Wash., are organizing a company to be capitalized at $75,000 to build shops for the construction of railroad cars.

The Valley Foundry & Machine Co., Fresno, Calif., has been incorporated with a capital of $25,000.

The American Metal Wheel & Foundry Co., of Toledo, O., has been incorporated with a capital of $150,000, under the laws of West Virginia. The incorporators are: J. C McKisson, C. E. B. Lanson, A. Argue, I. C. Tabor and W. A. Steddy, of Toledo.

The Greenberg & Blumenstein Iron Works, New York City, have been incorporated with a capital of $6,000.

The North Wales Foundry Co., North Wales, Pa., has been incorporated by Frederick Sabin, Howard Miller, and Samuel C. Wells.

The Jenison Iron & Engineering Works, Jenison, Mich., have been incorporated with a capital of $90,000. The officers of the company are: I. Preston Rice, of the Malleable Iron Works of that city, chairman; F. C. Marshall, for sixteen years with the Alabastine Co., vice chairman and treasurer, and Robert T. Copper, secretary. The company has secured a large brick building suitable to its needs, and equipped it with new machinery. The company will manufacture a number of specialties, including an electric headlight for locomotives.

The Hawaiian Sugar Co. is expected to be in the market shortly for machinery.

The Leonard Sheet Metal Works, New York City, have been incorporated with a capital of $100,000.

The John C. Heughes Moulding Co., Rochester, N. Y., has been incorporated with a capital of $60,000.

The American Machinery & Supply Co., Baltimore, Md., has been incorporated with a capital of $25,000, for the manufacture of machinery and machinists' supplies. The incorporators are: William S. Aumen, Joseph G. Coale, W. Claude Chapman, William J. O'Brien, Jr., and Wm. F. C. Gerhardt.

The Peden Iron & Steel Co., Houston, Texas, has decided to increase its capital stock from $250,000 to $500,000. The officers of the company will remain the same, but the board of directors has been increased by the addition of two new members, E. B. Parker and Dr. S. C. Red.

The Chas. Holmes Machine Co., Portland, Me., has been organized with a capital of $200,000. M. A. Holmes is president and H. S. Hitchcock, treasurer, both being from Newton, Me.

The Hall Rail Joint Co., of Chicago, has been incorporated with a capital of $200,000 to manufacture railway supplies and equipment.

The Rotary Bevel Shear Co., Chicago, has been incorporated with a capital of $5,000.

The Cooper, Wigand & Cooke Co., Paterson, N. J., has been incorporated with a capital of $400,000. The president will be John Cooper, of New York; vice president, John K. Cooke, Paterson; secretary and treasurer, A. A Wigand, of New York; general manager, O. W. Cooke, Paterson. John K. Cooke is now general manager of the Passaic Rolling Mill Co.

O. K. Harry Steel Works, St. Louis, Mo., want 10-foot square shears, second-hand.

L. W. Gunby Co., Salisbury, Md., will be in the market for lathes, planers and other machinery, and a traveling crane.

Gaskill Hardware & Machine Supply Co., New Berne, N. C., wants catalogues of machinery and mill supplies.

Union Iron Works Co., Selma, Ala., will buy a standard-gauge Shay locomotive, about thirty tons, and one eight-wheel standard-gauge locomotive, about thirty tons.

Casey & Michael, Harrisonville, O., want price lists of engine lathes, iron working tools, etc., second-hand, and of engines and boilers.

The Marion Smoke Consumer Co., capital $25,000, has been incorporated at Marion, O., by J. H. Hawke, T. D. Wogan, John F. Lust, G. W. Walters and F. A. Lust.

The Donavin Wire & Iron Co, capital $100,000, has been incorporated at Toledo, O., by D. C. Donavin, M. J. Donavin, G. Glauss, Matthew Donavin and Chas. F. Roehl.

The Standard Roofing Co., capital $5,000, has been incorporated at Cincinnati, O., by W. E. Forshee, M. E. Fowler, J. B. Towler, Thomas S. Harkins and M. E. Forshee.

The American Iron & Supply Co., Marietta, O., has been incorporated with a capital of $50,000.

The Continental Iron Mining Co., of Baraboo, Wis., capital $50,000, has been incorporated by Edwin S. Rich, J. R. Hofstatter, C. M. Butler and V. H. Cady.

The Canarius-Dudley Co., Terre Haute, Ind., has been incorporated with a capital stock of $10,000, with Frank Carnarius, Alvin W. Dudley and Gertrude E. Bradley as directors. The business, that of wholesale dealing in roofing, guttering, cornice, ornamental iron and tinners' supplies, has been carried on for six years by the firm. The buildings now occupied will be improved.

The F. E. Carpenter Co., New York, which will manufacture ornamental wrought iron, has been incorporated with a capital of $20,000.

The Frank F. Porter Co., Chicago, capital $30,000, has been incorporated for manufacturing furnaces and sheet metal work; incorporators, Frank F. Porter, Ludie V. Porter and Simon J. Koehler.

The Victor Smelting & Refining Co., Chicago, capital $10,000, has been incorporated for manufacturing, smelting and refining metals; the incorporators are M. J. Isaacs, Theo. C. Robinson and I. Harris.

Joseph R. Brown, C. E. Jenkins, William Goss, Miss Belle Taylor and others have incorporated the Dolet Coal, Iron & Mineral Co., Mansfield, La., to develop coal, iron and other minerals on 20,000 acres of land. Capital stock is $200,000.

The International & Great Northern Railway will establish shops at Mart, Texas, for the Fort Worth division; Leroy Trice, general manager, Palestine, Texas.

The Chicago-Tennessee Coal & Coke Co., Waldensia, Tenn., has about 9,000 acres of coal land. A mine has been opened on slope and about 150 tons daily is the output. Sixty coke ovens have been completed; erection of sixty more is about to begin, and a third battery of sixty will be erected later on. David S. McMullen, president, has charge of the developments; offices at No. 125 La Salle St., Chicago.

A. G. Holmes and A. A. Park have incorporated the Holmes Tool Co., Council, N. C., for manufacturing files, dipper cutters and other tools; capital $20,000.

The Crown Casting Co., Jackson, O., manufacturer of soil pipe and fittings, has increased its capital from $50,000 to $100,000, and will add a stove department to its business. It has just completed a stock shed 40x190 and is building a warehouse 40x120, two stories. The company contemplates the erection of additional room for its foundry, and will add another cupola, etc., during the next few months. These buildings, in addition to the present foundry building, which is 110x335, will give ample room to take care of its rapidly growing trade. The company has a plot of ground of 6½ acres, and has connection with the three railroads entering Jackson. It has sufficient orders on its books to keep it busy for the next five or six months.

The Gibbs Engineering & Mfg. Co., of Corning, N. Y., has been incorporated with a capital of $1,000,000, to manufacture motors. The directors are: L. T. Gibbs,

Samuel Riker, Jr., P. J. Fuller, C. M. Kirby and J. S. Richards, of New York City.

The American Industrial Co., Chicago, recently incorporated, will make special machinery, piano hardware and metal specialties. The company will be an extensive user of cold drawn shafting, castings and bright steel of special dimensions, flats and sheets. The company does not contemplate building at present and will be located at its present quarters, 63 and 65 South Canal St., Chicago.

Nearly half a million dollars will be expended in machine tools for installation in new shops to be built at Montreal by the Canadian Pacific Railroad.

The Globe Fence Co. has been organized at Jackson, Mich., to manufacture wire fences. The officers are: President, Edward Frensdorf, of Hudson; vice president, J. M. Lamb, of Adrian; secretary, A. C. Mills, of Jackson; treasurer, A. M. Lamb, of Adrian. These with Charles Kerfuss, of Hudson, constitute the board of directors.

A commission has been issued to the Harris Manufacturing Co., of Greenville, S. C., which proposes to manufacture steam valves, devices for signaling on railway trains, etc., on a capital stock of $12,000.

The Berry Foundry & Mfg. Co., St. Joseph, Mo., has been incorporated. G. T., T. G. and D. D. Berry recently bought the Columbia foundry from T. C. Roberts. The company has been reorganized and the capital stock increased from $12,500 to $50,000.

The stockholders of the Aurora Foundry & Machine Works, Aurora, Mo., will vote April 6 on a proposition to increase the capital stock from $75,000 to $110,000 in order to erect new buildings at Aurora and at Iola, Kan., and to construct and equip a plant at Galena, Ill.

The John S. Dooly Furnace Co., St. Louis, has been incorporated with a capital of $18,000 by John S. Dooly, trustee for Robert and Albert Dooly; Samuel S., Margaret, William H., Charles E., Mary and Thomas L. Dooly.

Fires and Accidents:—

A fire in the plant of the Uniform Steel Co., Rahway, N. J., caused a loss of $30,000. Nearly all the workshops were burned to the ground, but the foundry escaped with slight damage. The fire was caused by lightning.

The spike and part of the horseshoe department of the Tredegar Iron Works, at Richmond, Va., were destroyed by fire February 10th. The loss is estimated at $100,000.

Two lives were lost and ten men had narrow escapes February 11, as the result of a fire in No. 3 shaft at the Spruce Mine at Eveleth, Minn., owned by the United States Steel Corporation. The fire was caused by the explosion of a lantern.

One person was killed, two fatally injured and four others badly hurt February 10th, as the result of the explosion of a boiler in the foundry operated by Chas. Helminger at Adell, near Sheboygan, Wis. The foundry was demolished and the hotel across the street partially wrecked. The property loss is estimated at $20,000.

New Construction:

The New Albany Mfg. Co., New Albany, Ind., has commenced the work of making excavations for an addition to the machine shops of its plant.

The Miles Steel Tool Co., Hamilton, O., has awarded the contracts for the erection of the buildings of its plant. Work will be begun at once.

The plans have been completed for the new foundry building to be erected by the Wilks Foundry Co., Toledo. The new building will be 100x250 feet, and work on it will be commenced as soon as the weather will allow. It will cost about $20,000.

The new foundry of the New York Air Brake Co., Watertown, N. Y., is rapidly nearing completion, and will soon be ready for the equipment. The company now employs about 1,000 men, and every department is running to its utmost capacity.

The Milliken Bros., Brooklyn, manufacturers of steel, will erect a steel plant on the Staten Island flats, directly opposite Elizabeth, N. J. The cost will be about $40,000.

The American Brake Shoe & Foundry Co. which operates the Corning Iron Works, Corning, N. Y., has taken a large contract for the manufacture of the Symington oil boxes used on the journal of steam railway cars, and as the result of the contract extensive additions will be necessary at the Corning plant. A new cupola will be added.

The Gunby Mfg. Co., recently incorporated at Salisbury, Md., with a capital of $150,000, has decided to begin, as soon as practicable, the construction of a large machine shop and foundry. The incorporators are: L. W. Gunby, president and general manager; Graham Gunby, Edward C. Gunby, Frederick L. Smith, Donald Graham, Frank M. Gunby and Jas. T. Malone.

The Sanders Plow Co., Chattanooga, Tenn., has commenced the erection of a foundry addition to its machine department. The company was organized about a year ago, and its foundry work has been done by the Chattanooga Car & Foundry Co. The new addition will be 80x100 feet, and will be equipped with machinery of the latest design. The company has made rapid progress in the last few months.

The Columbia Iron Works, St. Clair, Mich., is installing a large electric crane at its shipbuilding plant. A large steel derrick will soon be erected.

It is reported that one of the buildings to be erected by the Rock Island Railroad, at Moline, Ill., will be 300x1,500 feet. Everything is said to be in readiness for staking out the entire tract, as soon as the consent of city officials is obtained for the abandonment of a highway. The Rock Island Improvement Co. has been incorporated with a capital of $2,000,000. It is understood that this company will build and equip the new shops.

Chas. E. Meyers & Co., Leroy, Ill., near Bloomington, have begun the erection of a foundry 50x125 feet.

The directors of the Portland Iron & Steel Co. have decided to rebuild the plant at Ligonia, Me., which was burned, for the second time within a few years, in August, 1902.

The machine shops of the Alexandria Iron Co., Alexandria, Va., destroyed by fire January 13th, are being rebuilt.

F. R. Sargent will establish a foundry and machine shop at Imlay City, Mich., in the spring. The buildings will be constructed of stone and cement.

The Jewett Car Co., Newark, O., is arranging to increase the capacity of its shops in West Newark.

The American Palace Car Co., recently incorporated under the laws of New Jersey, with a capital of $1,500,000, with offices in New York City, is considering the advisability of locating its shops at Rochester, N. Y.

A concession has been granted by the Mexican government to Emilio Segura, of Mexico City, for the establishment of a plant for the manufacture of steel on the Bessemer system in Tepeyahualco, Libres district, in the State of Pueblo. A complete plant for rail making and for turning out beams, columns, etc., is proposed. Material, machinery, etc., requisite for the plants are to be imported free of duty. Construction work will begin this month.

The Gogebic Steam Boiler Works Co., Duluth, Minn., ave built an addition and installed new machinery, which will largely increase the capacity of the plant.

Officers of the Chicago & Alton Railway have decided that the company must have more shop, roundhouse, and yard room. The company prefers to make the additions at Bloomington, Ill., where it already has large shops, but if land cannot be obtained at reasonable cost the additions will be located at Normal, Ill., or some other city.

The Burns Boiler & Mfg. Co., West De Pere, Wis., has purchased a site and will build a main shop of 100x200 feet and a smaller shop 40x80 feet. The main shop will be equipped with electric, hydraulic, and pneumatic tools necessary for a first-class plant in boiler and sheet iron work. There will be an electric crane running full length of main shop, and also a tower jib crane. A private lighting, power and heating plant will be installed. The company will spare no expense to make its plant

one of the best and most thoroughly equipped of its kind in the country.

The Harrisburg Mfg. & Boiler Co., Harrisburg, Pa., has contracted for a steel building 44x180 feet, to replace that portion of the plant destroyed by the recent fire. The company intends to let contracts very soon for an addition to the building 44x165 feet, constructed for the use of electric cranes, which will make the main boiler shop 44x345 feet. In this will be placed an additional 10-foot electric crane. The company intends increasing its capital stock from $100,000 to $200,000. It also expects to make further extensions.

The Holbrook-Armstrong Iron Co., Racine, Wis., has rebuilt its core room, which was damaged by fire January 31st. The company is now in position, with its modern facilities, to handle any size core required in making large castings. It has one of the finest core rooms in the state.

Love Bros., Inc., successors to Love Bros.' Architectural Iron Works, Aurora, Ill., are tearing down a number of their old buildings, and are erecting a mill, chipping and cleaning building, 42x130 feet. They also contemplate the erection of an addition to the structural shop 55x80 feet.

The London Engine Supplies Co., London, Ont., contemplates building a boiler shop 80x140 feet, and equipping the same with up-to-date machinery, making boiler and heavy sheet iron work one of its specialties. The company will manufacture boilers of various types, also giving close attention to special boiler and tank work.

The Hannibal Stove Foundry Co., Hannibal, Mo., is erecting a warehouse, 200x60 feet, four stories. It will replace the old warehouse, which will be used as an addition to the manufacturing plant, increasing the output 50 percent.

Recent purchases of land in North Reading, Pa., give the Reading Foundry Co. a tract three squares long and over a square wide. Work will be begun, probably within six months, on a great plant, with steel buildings. The works now at Second and Chestnut Sts. will be torn down and all operations concentrated at the new site.

The Laconia Car Co., Laconia, N. H., will build an addition to its malleable iron foundry which will increase its capacity 20 percent.

C. I. Bewley and F. G. Jones, of Chicago, will build a foundry at Oregon, Ill.

Bids have been received by the Pennsylvania R. R. Co. and the contract will soon be awarded for the construction of a one-story brick and steel machine shop, 80x100 feet at Fairview, Pa.

Plans have been completed and estimates are about to be taken for installing boilers and induced draft apparatus in the power house of the Jeanesville Iron Works Co., Jeanesville, Pa. Two 220-h. p. horizontal water tube boilers set in one battery and a 44-inch steel stack are to be put in.

The chief engineer of the D. L. & W. R. R. Co., Hoboken, N. J., has invited bids for the construction of the following brick and steel buildings at Keyser Valley, Pa.: Machine shop, 80x180 feet; wood-working shop, 100x400 feet; power house, 50x100 feet; blacksmith shop, 80x300 feet; paint shop, 60x400 feet; store house, 40x100 feet, and several smaller buildings.

At Winnipeg, Man., a foundry and machine shop, 300x100 feet, will be erected by the Rat Portage Iron Works at a cost of $12,000. The equipment will cost $25,000. Electricity, generated by water power, will be used in about 18 months.

Plans are being prepared for a new foundry building, 90x225 feet, for the Ajax Metal Co., Philadelphia.

Work will soon be started at Weatherly, Pa., on a new foundry for the Weatherly Foundry & Machine Co.

The Union Furnace Mfg. Co., Altoona, Pa., manufacturer of shovels, spades and scoops and pressed steel specialties, is rebuilding and enlarging the works destroyed by fire last September.

The Toledo Machine & Tool Co., Toledo, O., has outgrown its present plant and is negotiating for a new location. It is proposed to build a plant, 600 by 100 feet, two stories.

The Illinois Central R. R. is preparing to enlarge its machine shop at Paducah, Ky.

The Pittsburg District:—

The Damascus Nickel Steel Co., of Carnegie, Pa., has awarded a contract to the Wheeling Mold & Foundry Co. for the installation of a 16-inch merchant bar mill and it is probable that it will be erected complete for operation about May 1. It is also the intention to install a 22-inch sheet mill in the very near future although no contract for the same has yet been awarded. The small 10-inch mill installed some time ago is operating in full and owing to the growing demand for the company's high grade steels it has been decided to make the additions noted above.

It has been definitely decided to carry out the projected erection of a 25-mile railroad to connect the plant of the Union Steel Co. at Donora, Pa., with its coal and coking properties located at New Salem, a short distance west of Uniontown, Pa. When the Union Steel Co. was absorbed by the United States Steel Corporation this matter was held up temporarily but a recent decision will result in the erection of the road. Application was made some time ago for permission to erect a bridge over the Monongahela river at Donora to connect this road with the Pittsburg & Lake Erie railroad but has not yet been acted upon.

The Connellsville Central Coke Co., composed chiefly of Pittsburg capital has been incorporated with $100,000 capital. The headquarters of the company are at New Salem, Fayette county, Pa. The company owns at present a large body of coking land in the Klondike region and and has in operation 200 ovens. It has been decided to erect 150 additional ovens, but owing to the scarcity of material for coke ovens it will be at least a year before these ovens can be placed in operation. The directors of the company are Herbert Dupuy, John H. Hillman, John H. Neff and John P. Brennan.

The Diamond Coal & Coke Co., of Pittsburg has been granted a Pennsylvania charter with a capitalization of $100,000.

The J. S. McCormick Co., of Pittsburg, dealer in foundry equipment and supplies has applied for a charter and will increase its capitalization from $50,000 to $150,000. The company is now operating foundry facing mills at Mauch Chunk, Pa., and one on 25th St., Pittsburg. During the past year the output of these plants has been doubled and it is owing to the rapidly increasing business that it has been decided to increase the capital stock. J. S. McCormick is president and P. E. Malone, secretary and treasurer. J. W. Pennock and the above named officials comprise the board of directors.

Stocks and bonds of the Harbison-Walker Refractories Co. were listed on the Pittsburg stock exchange last week. There was some trading in the preferred shares at 73.

The annual meeting of the Standard Steel Car Co. whose plant is located at Butler, Pa., was held in Pittsburg last week. President Hansen announced that the Butler plant is operating at its fullest capacity and that orders are now booked aggregating $15,000,000. It was decided to issue $2,000,000 worth of bonds and a special meeting of the stockholders will be held on April 15 for the purpose of ratifying the proposition. The company at present has no bonded debt. No announcement has been made for what purpose the proceeds of the bond issue will be used but probably for extensions to the plant. The board of directors was increased from 7 to 11 members, the following being elected: R. B. Mellon, E. H. Jennings, W. L. Mellon, J. M. Hansen, J. B. Brady, Henry Aiken, L. G. Woods, Henry Rea, A. R. Fraser, Edwin Hawley and L. C. Weir. Officers were elected as follows: John M. Hansen, president; J. B. Brady, vice president; A. R. Fraser, treasurer; A. S. Valentine, secretary; P. F. McCool, general manager; W. O. Jacquette, general sales agent.

Victor Beutner, mechanical engineer, with offices in the

Westinghouse Building, Pittsburg, has been engaged to design and construct a fire brick plant for the Brady's Bend Fire Brick Co. at Brady's Bend, Pa. This company was recently incorporated with $100,000 capital.

General Industrial Notes:—

The Massillon Bridge Co., Massillon, O., has received an offer from Toledo, O., of a site for its plant. General Manager Jacobs says that the company must have more extensive yard facilities.

The L. C. Smith & Bros.' Typewriter Co., Syracuse, N. Y., recently incorporated, has purchased a site 264x231 feet in that city, on which it is understood the new typewriter factory of the company will be erected.

The first heat was taken off a few days ago at the new open-hearth furnaces of the Wickwire Bros.' wire mills, Burton, Cortland, N. Y. The new rolling mill of this firm has also been placed in operation and 150 men added to the force.

The Southern Car & Foundry Co., Anniston, Ala., whose plant had been idle since the boiler explosion on January 28, resumed operations last week.

The Platteville Iron Works, Platteville, Wis., recently incorporated with a capital of $60,000, will manufacture mining machinery, and will employ from 30 to 60 men.

The Batavia Carriage Wheel Co., Batavia, N. Y., has changed hands again, and the entire capital stock of the corporation, amounting to about $125,000, has been transferred by the Anti-Friction Co., of New York, to the original stockholders, who are all citizens of Batavia.

Schulte & Hinken will open their new iron foundry at Fort Madison, Iowa, this week.

The Morgan Iron Works, Spartenburg, S. C., have been sold to W. S. Montgomery and others, for $16,400.

The Dominion Oil Filter & Metal Co., Guelph, Canada, which started business about four years ago, operated by Kelly Bros., has absorbed the Guelph Foundry Co., taking the name of the latter company.

Burns & Son have recently opened a large and well equipped foundry in Kansas City, Mo. Mr. Burns formerly owned a foundry at Leavenworth, Kas., which was burned.

At the recent meeting of the stockholders of the Union Iron Works, San Francisco, the following directors were elected: Henry T. Scott, Irving M. Scott, W. G. Dodd, P. N. Lilienthal, F. W. Zeile, Lewis Nixon, Max Pam. The directors elected as chairman of the board, Henry T. Scott; president, W. G. Dodd; secretary and treasurer, Charles N. Champion. Henry T. Scott will continue, as heretofore, to be the executive and financial head of the organization. Irving M. Scott will be elected the California director of the United States Shipbuilding Co. A naval architect and constructor will be made vice president.

The American Tool Works, Cincinnati, has secured a large order from Madrid, Spain, for lathes and drills.

The thirty-sixth annual meeting of the Montreal Rolling Mills Co., Montreal, Canada, was held last week. It was decided to enlarge the plant during the present year. E. S. Clouston was chosen president; William McMaster, vice president and general manager. The directors are: Senator Drummond, Senator Mackay, Messrs. H. Montagu Allan, James Ross and J. S. McLennan. Mr. J. L. Waldie was re-appointed secretary.

The Sucker State Drill Co. is considering an offer to remove its plant from its present location in Belleville, Ill., to Ashley, Ill. During the past year, the company has had much trouble with its employes, not over wages, but, as the company claims, the men insisted upon dictating who should be employed. We are advised that the company has not yet decided what it will do in regard to removing its plant. All branches of business in Belleville are said to be having trouble with labor unions.

The stockholders of the Newark Steel & Iron Co., Newark, O., have elected the following directors: J. W. Lee, of Pittsburg; W. Phillips, Jr., Pittsburg; F. H. Bock, Pittsburg; J. P. Sharp, Pittsburg, and J. H. Newton, J. R. Goldsborough, Samuel Norris, Hon. Wm. E. Miller and Judge J. M. Swartz, of Newark. The stockholders have commended the board of directors for placing the works in the hands of a receiver, and directed the new directors to continue the work with the receiver until such time as they should determine whether they would raise the receivership or allow the works to be sold. The new directors elected Judge J. M. Swartz president and W. E. Miller secretary and treasurer.

Control of the two furnaces at Chickies, Pa., has been acquired by the Standard Iron Mining & Furnace Co., which expects to blow in one of the furnaces in April. The name of the furnaces has been changed from "Chickies" to "Standard." They were last active in 1900.

The Sheffield Coal & Iron Co., which on Sept. 1, 1902, acquired the three furnaces at Sheffield, Ala., formerly operated by the Tennessee Coal, Iron & Railroad Co., had one furnace only in operation on Dec. 31. One of the idle furnaces will resume in February and the other in April.

The Gaylord Iron Co. has sold its furnace and property at Detroit, Mich., to parties not interested in the iron business. While the stone stack is still standing, the engines, boilers, and hot-blast stoves have been taken out. The company has been dissolved.

The Jefferson Iron Co., Jefferson, Texas, will blow in its charcoal furnace in February. It has been idle since 1900.

The Preble Machine Works, South Chicago, Ill., recently incorporated, is doing a general jobbing business in both machine shop and foundry lines. Frank F. Porter is president and Miss E. F. Jones secretary and treasurer.

The Chicago Pneumatic Tool Co. has announced that the removal of its plant at Aurora, Ill., to Cleveland, and its consolidation with the Cleveland plant, have been definitely decided upon, and same will take place in the near future. This move has been under contemplation for some time, and will undoubtedly result to the benefit of both the Chicago Pneumatic Tool Co. and its patrons, as the consolidation not only makes more economical production possible, but will also largely increase the output.

The Empire Bridge Co., being unable to obtain land near its plant at Albany, N. Y., on which to erect an addition, is considering the advisability of moving to Bucher Island, near Troy, N. Y., where the plant of the Troy Steel Co., now owned by the United States Steel Corporation, is located.

The Wetler Steel Sand Co., Massillon, recently incorporated, is not a new concern, having previously been a partnership. The company is not in the market for machinery.

The Wheeling Steel & Iron Co., Wheeling, W. Va., has purchased 1,000 acres of coal land on the Upper Monongahela river from J. V. Thompson, of Uniontown, Pa., but has not yet decided concerning coke ovens.

The Bond Steel Post Co., Adrian, Mich., has voted to increase its capital stock from $40,000 to $100,000, which is now fully paid up. This action was taken on account of increasing business. The company manufactures steel posts for all purposes and rural mail boxes.

The National Brass Mfg. Co., Rochester, N. Y., has its new buildings completed and will occupy them about March 1. The company will manufacture brass work of all kinds, both finished and in the rough, and will also turn out brass and phosphor bronze and aluminum castings.

Pressed Steel Tank Co., Milwaukee, Wis., is crowded with work on orders for tanks and other pressed steel specialties.

The Vilter Mfg. Co., Milwaukee, reports the receipt of a large number of orders for Corliss engines, ice making and refrigerating machinery, the bulk of them going to the East and Central States. In a few days a complete ice making plant will be shipped to Central America. Another addition to the company's foundry has just been completed, materially increasing its capacity.